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COLUMBIA- PRESBYTERIAN MEDICAL CENTER

ANNUAL REPORT 1968



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"For of the most high cometh healing"



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TENTH COMBINED ANNUAL REPORT

of the

COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York, N. Y. 10032



College of Physicians and Surgeons · Columbia University
in the City of New York

School of Dental and Oral Surgery · Columbia University
in the City of New York

and

The Presbyterian Hospital in the City of New York

December 31, 1968

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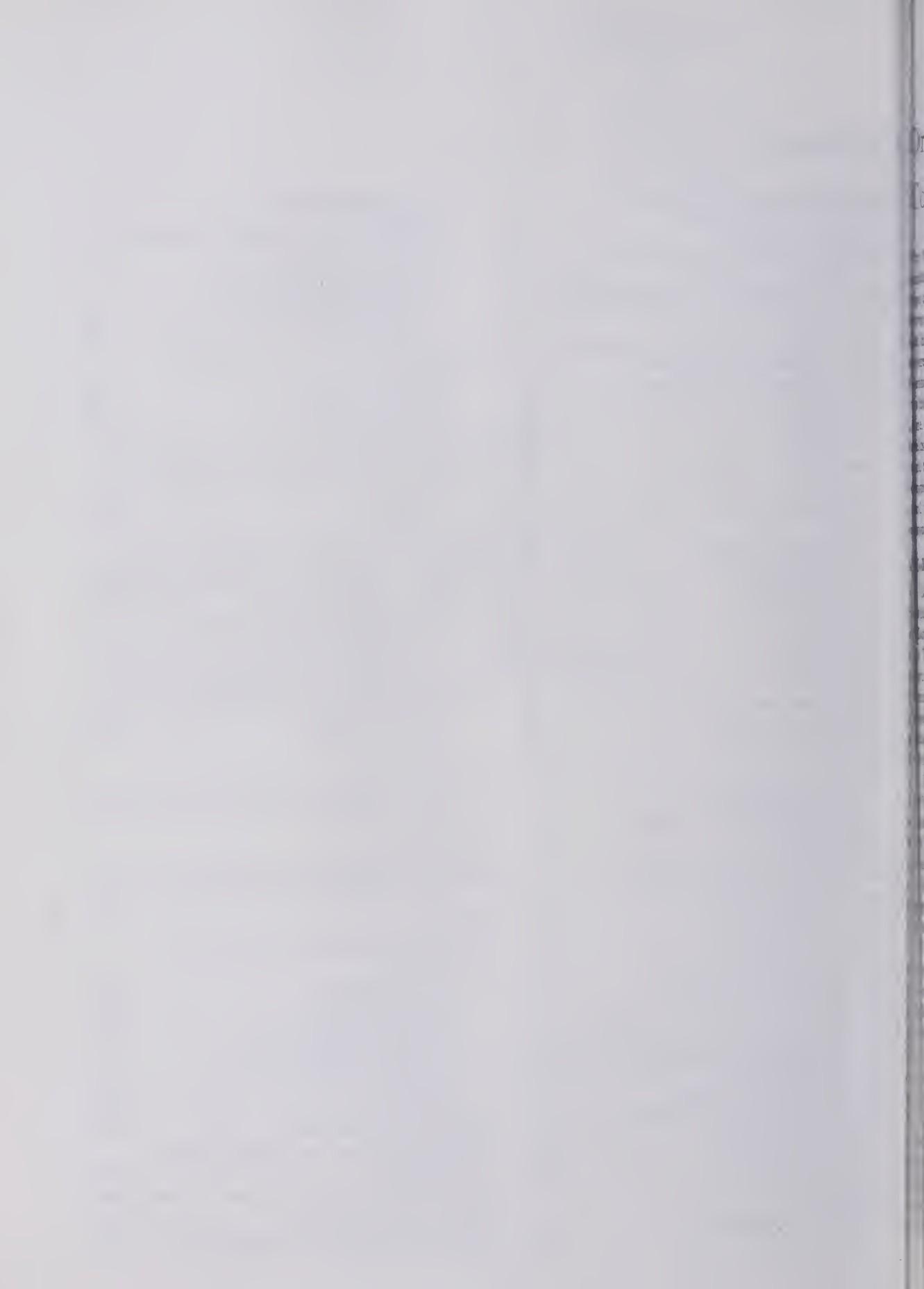
This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who prepare to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 7,500 people who serve and study within the Hospital and College, who give life and breath to this concept.

“Those who serve” include every worker — professional, non-professional, student and volunteer. These are the people who provide the best in patient care today and contribute toward advancement in health and medical science tomorrow.

Contents

ORIGIN AND FUNCTIONS OF THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER	1
REPORT OF THE PRESIDENT	
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	5
REPORT OF THE PRESIDENT OF THE MEDICAL BOARD THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	10
REPORT OF THE DEAN OF THE FACULTY OF MEDICINE COLLEGE OF PHYSICIANS AND SURGEONS.....	
REPORTS OF DEPARTMENTS AND SERVICES.....	
Anatomy	17
Anesthesiology	18
Biochemistry	22
Dermatology	26
Medicine	29
Microbiology	42
Neurological Surgery	46
Neurology	49
Nursing	56
Obstetrics and Gynecology	59
Ophthalmology	66
Orthopaedic Surgery	70
Otolaryngology	74
Pathology	76
Pediatrics	80
Pharmacology	87
Physiology	90
Psychiatry	93
Public Health and Administrative Medicine	99
Radiology	106
Rehabilitation Medicine	114
Surgery	116
Urology	126
International Institute for the Study of Human Reproduction	131
Institute of Comparative Medicine.....	135
Medical Library	137
1968 PUBLICATIONS OF MEMBERS OF THE PROFESSIONAL AND ACADEMIC STAFFS.....	140
REPORT OF THE DEAN OF THE FACULTY OF DENTAL AND ORAL SURGERY.....	185
DENTAL AND ORAL SURGERY.....	188
PUBLICATIONS OF MEMBERS OF THE PROFESSIONAL AND ACADEMIC STAFFS.....	192
REPORTS OF WOMEN'S AUXILIARIES	
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	193
Board of Women Managers, Babies Hospital	194
Cribside Social Service Committee	196
Mary Harkness Auxiliary	197
Neurological Institute Auxiliary	198
Women's Auxiliary of the New York Orthopaedic Hospital	200
Women's Auxiliary of the Presbyterian Hospital	202
TRUSTEES AND COMMITTEES.....	205
Trustees of Columbia University in the City of New York.....	206
Joint Administrative Board	207
Trustees of Columbia-Presbyterian Medical Center Fund, Inc.	207
Trustees and Officers of The Presbyterian Hospital in the City of New York.....	208
Committees of the Board of Trustees	210
Medical Board	210
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	213
Women's Auxiliaries	214
Members of the Corporation	217
Administrative Staff	219
PROFESSIONAL STAFF	
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	221
Consultants	222
Chiefs of Clinics	232
FACULTY OF MEDICINE	
COLLEGE OF PHYSICIANS AND SURGEONS	
COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	233
Officers of the Faculty	234
Committees of the Faculty	234
Joint Committees of Faculty of Medicine and Professional Staff of Presbyterian Hospital.....	235
SCHOOL OF DENTAL AND ORAL SURGERY	
COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	236
Officers of the Faculty	236
Academic Committees	236
ACADEMIC STAFF	
COLLEGE OF PHYSICIANS AND SURGEONS	
COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	237
Emeritus Officers	238
ACADEMIC STAFF	
SCHOOL OF DENTAL AND ORAL SURGERY	
COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	257
Emeritus Officers	258
APPENDIX	261
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	
Balance Sheet	262
Statement of Income	264
Summary of Fund Changes	266
Endowment Funds	268
Accountant's Opinion and Report of Auditing Committee	270
Group Retirement Plan	271
Statistics	272
THE WOMEN'S AUXILIARIES	274
THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.	278
THE ALUMNAE ASSOCIATION, SCHOOL OF NURSING	280
ENDOWED BEDS AND ROOMS	281
INDEX TO PROFESSIONAL AND ACADEMIC STAFFS	290



Origin and Functions of the Columbia-Presbyterian Medical Center

Medical Center, comprising a group of long established hospitals of high standing and the College of Physicians and Surgeons of Columbia University, furnishes an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the hospitals and the University the members of the staffs of the hospitals are nominated by Columbia University, and teaching and research are conducted in all the hospitals.

College of Physicians and Surgeons

Columbia University began as King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was renamed as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the trustees of the two institutions, the College of Physicians and Surgeons became the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the President of the College of Physicians and Surgeons. The

connection was only a nominal one, however, until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928, the College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. As a part of the Columbia-Presbyterian Medical Center, it is housed in a seventeen story, fire-resistant, steel, brick and concrete building, each floor connecting with the wards and services of Presbyterian Hospital.

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The School of Dental and Oral Surgery

In September, 1916, students in dentistry were admitted to courses in Columbia University at the College of Physicians and Surgeons. On March 15, 1917, the Trustees of Columbia University established a School of Dentistry as of September 27, 1916, so that the conduct of courses from that date, as forming part of the work of the School, might be officially recognized. The School was to be established "upon university lines," meaning "a school the requirements for admission to which shall be the same as those for admission to the Medical School and whose students shall then pursue a four year course, the first two years of which will be almost identical with the first two years of the course of Medicine. The last two years would be given to special preparation for dentistry and dental surgery."

Temporary quarters were utilized on West 39th Street, and in 1920 a small building was erected adjacent to the entrance of the College of Physicians and Surgeons on West 59th Street in which instruction was carried on until the spring of 1923. In the course of that spring and summer, negotiations for the merging of the College of Dental and Oral Surgery with the Dental School of Columbia University were completed and, in September, 1923,

the new institution became the School of Dental and Oral Surgery, established in the buildings of the older private corporation on East 35th Street. On completion of the Medical Center in 1928, the School moved to its present quarters where it is adjacent to the basic science departments of the University, the Medical Library and Vanderbilt Clinic.

The School provides undergraduate instruction in dentistry and dental hygiene. Postgraduate courses in the specialties of dentistry and a master's degree in dental hygiene are offered. Clinics, open to the public, are conducted in all areas of dentistry and the Hospital Dental Service is staffed and maintained by the School.

William Black Medical Research Building

The newest addition to the Columbia-Presbyterian Medical Center is the 20-story William Black Medical Research Building at 168th Street and Fort Washington Avenue. The building is now used exclusively for research with all departments of P&S expanding their present quarters. The building, dedicated January 3, 1966, was named for William Black, founder and Chairman of the Board of the Chock Full o' Nuts Corp. The financing of the building was made possible in part by a \$5,000,000 gift from Mr. Black to P&S.

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital in the City of New York is the corporate title for all the voluntary hospitals and clinics at The Columbia-Presbyterian Medical Center. Some 140,000 patients a year are cared for in the hospitals, clinics, and doctors' offices of the Medical Center. The group consists of the following units:

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison and Park Avenues between 70th and 71st Streets. On April 25, 1911, Presbyterian Hospital made its original arrangement with Columbia University's College of Physicians and Surgeons for coordinating the care of the sick with the educational and research program of the University. Now Presbyterian Hospital is the largest single unit of the Medical Center. The Hospital occupies a 22-story building in which are the wards of the Medical and Surgical Services, Obstetrical and Gynecological Service, Urological Service, Ear, Nose and Throat Service, Dermatological Service and the Orthopedic Surgery Service.

Babies Hospital

Babies Hospital, 167th Street and Broadway, founded in 1887, provides for general medical and surgical care of infants and children up to their thirteenth birthday, and care for premature babies. The total capacity of the Hospital is 198. One floor is devoted to the care of private and semi-private patients. Both outdoor and indoor playrooms are provided for convalescent children. Laboratories are operated for the diagnostic and research work of the Hospital in pathology, microbiology and chemistry. An X-ray and fluoroscopic department is operated under the direction of the Hospital radiologist. An outpatient department is maintained in Vanderbilt Clinic by the attending and house staff of the Hospital. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

Under construction is a new 14 story addition to provide modern patient areas, laboratories, classrooms and special care units. The new addition will permit complete modernization of the old building.

The Dana W. Atchley Pavilion

This new highrise building, located at the corner of Fort Washington Avenue and 165th Street provides a modern facility for ambulatory-patient care. Here 175 physicians see their private patients, by appointment, for part of each day, and are close to the Hospital and College to fulfill their teaching duties and to serve in the wards and clinics.

Harkness Pavilion

Harkness Pavilion, 180 Fort Washington Avenue, erected when the Medical Center was established in 1928, is available for the accommodation of 30 adult private patients of the attending staff.

The Mary Harkness Unit

Mary Harkness Unit, King Street, Port Chester, N. Y., opened in 1937 to provide convalescent care for adults. In a beautiful country setting, facilities are available for the extended care of 55 adult

The Institute of Ophthalmology

Institute of Ophthalmology, 635 West 165th Street, opened in 1933, has complete facilities for the medical and surgical treatment of adult and children patients with diseases of the eye. There are private, semi-private and ward beds, with a total capacity of 104. On January 1, 1940, the work of the Herm

app Memorial Eye Hospital was taken over by
t Institute.

e Neurological Institute

Neurological Institute, 168th Street and Fort
shington Avenue, one of the first nongovern-
ntal hospitals in this country for the treatment of
ous diseases, was founded in 1909. It moved
m East 67th Street to the Medical Center in 1929.
affiliation with The Presbyterian Hospital has
de possible a broad basic program of teaching
research in neurology and in the treatment of
eases of the nervous system and surgical condi-
ns of the brain and nervous system. The Institute
s a capacity of 250 beds, including 15 added in
50 for psychiatric patients.

New York Orthopaedic Dispensary and Hospital

The New York Orthopaedic Dispensary and Hos-
tal opened as a dispensary in 1866 largely because
the interest taken in the care of the crippled by
odore Roosevelt, father of the President of the
ne name. In succeeding years, the dispensary
ew into a hospital with beds for ward and private
tients. In 1911, the first spinal fusion operation
Potts Disease (tuberculosis of the spine) was
rformed by Dr. Russell A. Hibbs. This successful
eration opened an entirely new era in treat-
ent of this disease. The Orthopaedic Dispensary
d Hospital was located in its own buildings at 420
st 59th Street until December, 1950, when it
oved to the Medical Center. On the 5th floor of
e main building, 622 West 168th Street, facilities
e available for the care and treatment of ortho-
dic conditions and fractures in children and adults.

Radiotherapy Center

One of the world's largest facilities for clinical
search in the X-ray treatment of cancer is located
jacent to Babies Hospital.

The School of Nursing

The School of Nursing was founded in 1892 for
e training of nurses. Since 1935, its educational
rogram has been under the supervision of the De-
partment of Nursing of the Faculty of Medicine of
e College of Physicians and Surgeons of Columbia
niversity. A thirty-two-month course in nursing is
nducted, and graduates receive the degree of
achelor of Science from Columbia University.

The Sloane Hospital for Women

Sloane Hospital for Women was built at West
59th Street and Amsterdam Avenue and presented
to Columbia University by Mr. and Mrs. William D.
Sloane in 1886. It now occupies three floors of the
Presbyterian Hospital building for ward and semi-
private patients and one floor in Harkness Pavilion
for private patients. There are 184 beds, of which
116 are ward beds.

The J. Bentley Squier Urological Clinic

The J. Bentley Squier Urological Clinic occupies
the 10th floor of the Presbyterian Hospital building
and the 10th floor of Babies Hospital. There are 67
beds for the care of adults and 20 beds for children.
There are laboratories fully equipped to do diag-
nostic, X-ray, bacteriological, pathological, fluoro-
scopic, and research work. This unit has two large,
especially equipped, operating rooms. The urologi-
cal outpatient department is in Vanderbilt Clinic.

Vanderbilt Clinic

Vanderbilt Clinic, Broadway and 167th Street,
presented to Columbia University by the Vanderbilt
family in 1888, is the common outpatient depart-
ment and admitting service for all the wards of all
the units of The Presbyterian Hospital. It is a fully
equipped dispensary offering complete medical, sur-
gical and specialty services. Eligibility to the Clinic
is determined by the admitting physician and the
clinic interviewer and is limited to those unable to
afford a private physician. The Group Practice
Clinic, organized in 1946, has proved a forward step
in the diagnosis and treatment of patients.

Other Patient Care Institutions Located at the Medical Center

The New York State Psychiatric Institute and
Hospital, built and maintained by the State of New
York, is a 174 bed hospital with provisions for the
study and treatment of all types of psychiatric
disorders.

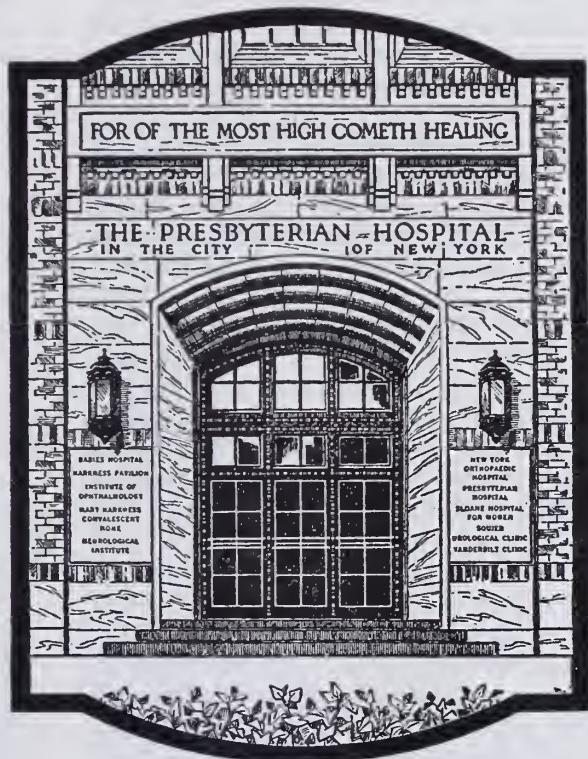
The Francis Delafield Hospital, built and main-
tained by the City of New York, is a 261 bed
limited general hospital with emphasis on the treat-
ment and study of cancer.

The Washington Heights Health and Teaching
Center was built and is maintained by the City of
New York.



Report of the President

The Presbyterian Hospital in the City of New York



Report of the President of the Presbyterian Hospital for 1968

Nineteen Hundred and Sixty-eight was the 100th year in the continuing history of The Presbyterian Hospital and a most successful one in every respect. It will be remembered particularly for goals reached in the Development Program and for new long-range plans and decisions made by Hospital leaders.

In 1968, the Hospital admitted 39,320 patients for a total of 475,709 days of care. There were 613,047 ambulatory patient visits to Vanderbilt Clinic and to Doctors' Private Offices, of which 30,088 Clinic visits were free. The Hospital's admission statistics have changed very little from those in recent years, indicating that its facilities and professional staff continue to be used at the same high level.

Operating expenses increased \$6,753,785 during 1968, compared with 1967, to a new high of \$53,828,235. Of this total amount, \$37,587,400 was for wages and fringe benefits and necessary increases in positions, raising the personnel roster to 4,775.

The Trustees approved two general wage increases for personnel during 1968, which were in addition to regular merit increases. And the Hospital's Group Retirement Plan, which was started in 1931, was again amended by action of the Trustees to provide improved retirement benefits for personnel. The amended plan became effective on January 1, 1969.

The need for more nurses and other highly-trained medical workers continues, due to increased demands and a shortage of such workers. To help meet this problem, the Hospital opened a School of Practical Nursing in 1968, and its first class of 18 students began the required year of study in September. In the future, two classes of 35 students

each are expected to be graduated each year. We are confident that after they pass the New York State licensing examination, many of the graduates will begin their nursing careers at Presbyterian Hospital.

Plans are also being formulated to open a school for x-ray technicians at the Hospital. Opening of the new school is expected to be announced in 1969.

Every effort is currently being made to improve efficiency throughout the Hospital. Plans are being evolved by the Hospital's Medical Administration Data Processing Department to speed accurate handling of patient information: a staff of administrators and professional personnel is working with system analysts and programmers toward this end.

From its beginning, the primary policy of the Hospital has been to place quality of services above all other considerations. The dedicated men and women — physicians, nurses and laymen — who planned the Medical Center, opened in 1928, were guided by two basic principles: to provide hospital and teaching facilities of a size to permit maximum efficiency and economies compatible with the best possible patient care and medical education, and to provide adequate facilities to encourage medical research.

Presbyterian Hospital has continued to maintain and enhance its high standards, but by 1959 over-crowding was becoming critical and maximum efficiency was being sacrificed because many of the facilities were becoming obsolete. After much planning and study jointly with Columbia University, the Trustees announced, in 1960, a \$50 million program of modernization and expansion, the first stage of the Medical Center had opened. Goals were set by the Development Program Committee, under Dr.

Chairmanship of General Lucius D. Clay, and an appeal for financial support of the Program was made to the public.

A total of nine major goals in the Development Program had been reached by the end of 1968: (1) More than \$19 million in Endowment to improve faculty salaries at the medical school, (2) Rehabilitation and Modernization of the College of Physicians and Surgeons, (3) Completion of the Service Building, (4) the William Black Research Building, (5) the Alumni Auditorium, (6) the Radiotherapy Center, (7) Basic Installations for Air-Conditioning the Medical Center, (8) Phase 1 of Expanded Parking Facility, and (9) the Dana W. Atchley Pavilion.

The Dana W. Atchley Pavilion was officially opened on December 5, 1968, and named by the trustees to honor Dr. Dana W. Atchley, a great physician and teacher who has given 52 years of service to Presbyterian Hospital and still continues active in his profession.

Major projects under construction at the end of 1968 were: Babies Hospital Expansion and Modernization, Institute of Ophthalmology Research Addition, Bard Hall Addition, Phase 2 of Expanded Parking Facilities, and new Advanced Patient-Care Facilities that include an Enlarged Cardiac Catheterization Unit and Central Diagnostic Facilities or the Department of Neurology.

Previously approved projects which will begin as soon as plans can be completed are: The Augustus Long Medical Library; Maxwell Hall Addition (a new facility for the School of Nursing); Reconstruction of Presbyterian Hospital's Fourth Floor, to provide patient areas where the Doctors' Private Offices were previously located; and Patient Special-Care Facilities that include an enlarged, modernized Cardiac Monitoring Unit, a new and enlarged Central Sterile Supply Unit, and a new Surgical Intensive Care Unit.

Early in November, 1968, the Trustees, after completing studies made in cooperation with the administrative and medical staffs, announced an updated, long-range master plan for the continued development and modernization of Columbia-Presbyterian Medical Center, calling for the expenditure of approximately \$100 million over the next ten years. Announced also was a fund-raising campaign to finance this extended Program. General Lucius D. Clay will continue to head the Development Program Committee. Federal, state and local government health agencies, foundations, individuals and the business community will be invited to support the Program.

Two of the five projects announced in the new long-range program are urgently needed and will start as soon as plans can be completed. They are:

Modern Emergency and Admitting Facilities at Vanderbilt Clinic. This high priority project represents the first step in long-range plans to expand and modernize Vanderbilt Clinic. A 5-story building, with basement, will be constructed over the present Ambulance Court, to provide 55,000 sq. ft. of urgently needed new space. An enlarged, modern emergency facility will be provided on the first floor as well as modern admitting and Clinic Administration offices. The upper floors will permit the relocation of several special clinics to relieve floor congestion in the older building and for expansion of the Medical Records Department, now cramped for space. Cost of this project is estimated at \$5,000,000.

The Court Building. This new building will be an addition to Presbyterian Hospital, extending into the court between the Hospital and the College. It will provide approximately 252,000 sq. ft. of new space to permit the extension of each floor of the Hospital. Completion of this building is the first step in long-range plans to air-condition and modernize existing Hospital patient-care areas. It will provide space for central diagnostic laboratories, departmental offices, classrooms, visitors' areas, and needed patient-supporting ancillary services. Estimated cost \$12,000,000.

The following projects, approved under the long-range program, will be completed in phases over a period of several years.

Expansion and Modernization of Vanderbilt Clinic. A 15-story addition will be constructed, adjoining the present buildings to provide an additional 210,000 sq. ft. of space. This will permit expansion of the Clinic's outpatient facilities, provide needed classrooms, examining and treatment rooms, patient waiting areas, and modern ancillary services. When this new space becomes available, the existing building will be reconstructed and completely modernized. Estimated cost: \$30,000,000.

Reconstruction and Rehabilitation of Ward and Semi-Private Rooms at the Medical Center. Adult semi-private and ward patient areas of Presbyterian Hospital, Neurological Institute, and the Institute of Ophthalmology will be reconstructed and modernized to provide maximum efficiency and the best possible patient care. Large ward and semi-private rooms will be converted to private, and semi-private rooms with a maximum of four beds. Needed doctors' and nurses' stations, treatment rooms, waiting rooms, fire escapes, toilet facilities, and air-condi-

tioning will be provided. This work will be done floor by floor, without disruption of services. Estimated cost: \$35,000,000.

Service Building Extension. Seven floors are to be added to the Service Building, adding 65,000 sq. ft. of new space. This will provide storage for disposable medical supplies and for materials used by Service and Maintenance Departments. Space will also be provided for the growing Data Processing Department, and for the financial and other offices to be moved from Presbyterian Hospital. Estimated Cost: \$4,500,000.

All who participate in this program of expansion and renewal can take satisfaction in knowing that they are helping carry on a tradition of public service that began with the founding of Presbyterian Hospital a century ago; that their support will provide the finest medical facilities for a professional staff that is dedicated to raising standards of patient care, medical education, and to extending its medical capabilities through research.

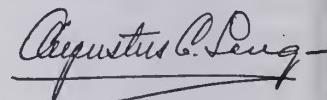
We are pleased to announce the election to the Board of Trustees of three distinguished gentlemen, long associated with the Hospital, whose experience and knowledge of its problems uniquely qualify them to serve as Trustees, namely, Mr. A. J. Binkert, Executive Vice President; Dr. Milton R. Porter, President of the Medical Board of Presbyterian Hospital; and Dr. H. Houston Merritt, Dean of the Faculty of Medicine of Columbia University.

Mrs. Byron Stookey, Chairman of the Neurological Institute Auxiliary from 1949 to 1954, and a hospital Corporation Member since 1951, was elected to the Board of Trustees early in January 1969.

During 1968, two of our most devoted and loyal Trustees, Mrs. Frederic F. deRham and Mr. Kenneth C. Towe, were elected honorary members of the Board. The Hospital is fortunate to have the continued benefit of their counsel and experience.

With sadness and a deep sense of loss, we report the death in 1968 of a dear friend and devoted Trustee, Mr. Gerald L. Phillippe; and of six great physicians who devoted the greater part of their professional lives to Presbyterian Hospital. Their contributions to medical knowledge won them international honors that, in turn, reflected honor upon the Hospital and all who supported their great work. They were Dr. Hattie E. Alexander, Dr. Frank Altmann, Dr. Frederick Randolph Bailey, Dr. Ralph H. Boots, Dr. William A. Horwitz and Dr. James W. Babcock.

We wish finally to express our appreciation to all personnel, to the professional staff, to the Auxiliary members, and to our Volunteers for their devotion to duty and loyalty to the Hospital; to Columbia University for its splendid cooperation; and especially to the friends and supporters of Presbyterian Hospital whose generosity permits the continuation of a century-old tradition of service to those who seek relief from illness and pain.



AUGUSTUS C. LONG
President

April 1, 1969

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

During the past year the professional staff, through the Medical Board and its committees, has applied itself diligently to the problem of solving or trying to solve problems which have arisen as a result of the new laws as they apply to the delivery of health care to the public. In addition there has been the need to work with the administration and trustees in the detailed planning of the new buildings being erected here at the Medical Center. In connection with the problem of adjusting to the new laws, several things have been accomplished. The distribution of the fees collected for professional services to ward and clinic patients has been considered at great length and after consulting legal counsel it was decided to proceed with the issuance of checks to the individual doctors. The ultimate disposition of the monies in question was then settled by the individual staff members, many of whom elected to donate these monies to their respective departments for the use of the institution. This solution was considered an appropriate and proper one for the situation at the time, but it was agreed that it would not necessarily serve as a precedent for future distributions, which may be made in accordance with a master plan or agreement yet to be devised. These matters are mentioned in this report because throughout the country medical staffs are exhibiting great and continuing interest in the solution of the problems posed by the arrival at hospitals of funds obtained for the care of ward and clinic patients. It is entirely likely that further study will result in a change in the manner in which this matter is handled in the future. In addition our staff has continued conversations with various branches of the city government in an effort to reach an agreement relative to the payment of Medicaid fees for patients in the hospital. These matters are still under study and it is hoped that some fair agreement may be reached which will help the physicians of the teaching hospitals of New York City, ours included, to share in the benefits currently being enjoyed by all other teaching hospital staffs in New York State.

Apart from these financial matters discussions have been held with appropriate commissioners of the City Government in regard to the whole problem of medical care in Northern Manhattan. In the course of these discussions it was agreed that although the Medical Center wanted to do its part,

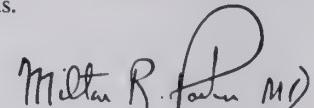
many of its facilities were over-loaded at present and that it could not take on, in an unrestricted way, all that the City Government would like to ask of it. For its part the city agreed with those present that there was no intent on its part to change the nature of the Columbia-Presbyterian Medical Center from a national and worldwide medical center to a purely community hospital.

In the field of the Development Program we were enormously pleased and delighted to have the magnificent new office accommodations for the staff in the Dana W. Atchley Pavilion, opened in December. For the first time in the memory of most of the staff really fine office accommodations are now available right on our "campus." This has given the staff a boost in morale and should result in raising the standards of our practice of medicine.

The staff wishes to express its gratitude to the Trustees, the administration and all those who played a role in bringing this magnificent building into being.

In addition during the year the Joint Resident Program Committee discussed the overall problem of rotating our house-staff through other hospitals with which Columbia maintains affiliations. Specific policies were outlined and it is hoped that by so doing some of the confusion which has attended the relatively uncoordinated activities in this sphere in the past will now be more uniform, more easily understood and fairer to all concerned.

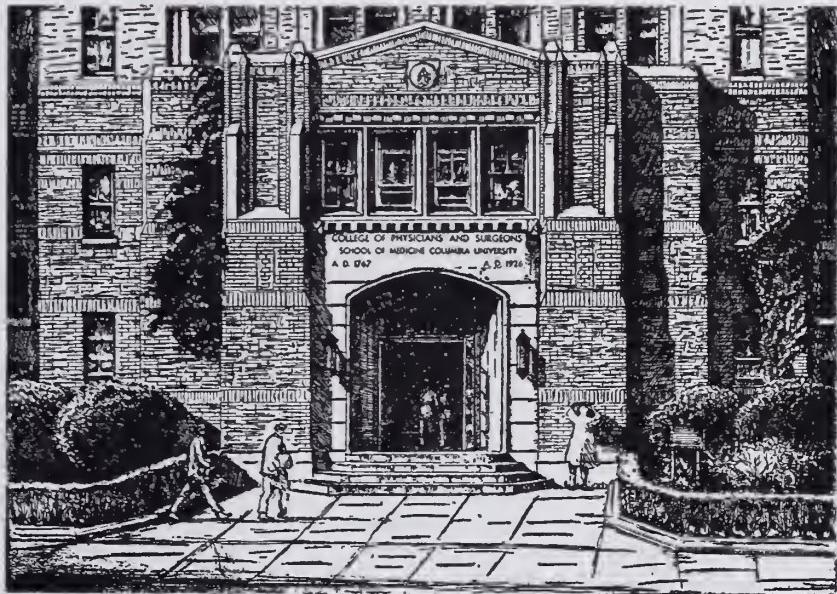
Lastly it is with great sorrow that the staff notes the passing of three of its most distinguished and most beloved members. During the year Dr. Franz Altman, Attending Otolaryngologist, Dr. Frederick R. Bailey, Attending Physician, and Dr. Arthur P. Stout, Surgical Pathologist, died. Each was outstanding in his field and each represented an asset that the Medical Center will sorely miss. Not only were these three men recognized leaders in their particular specialties but all were deeply respected and much loved by their colleagues who will long remember them for their kindness and for all that they have taught us.



MILTON R. PORTER, M.D.
President of the Medical Board

Report of the Dean
of the Faculty of Medicine

College of Physicians and Surgeons
Columbia University in the City of New York





Report of the Dean of the Faculty of Medicine

The report of the Dean in 1967 dealt at some length with the celebration of the two hundredth anniversary of the founding of the school. Little did we realize at the time of the writing of that report what dramatic changes the beginning of the third century would bring particularly with regard to changes in methods of medical education and the rapidity with which these would be put into effect.

The committee, which was appointed in 1966 to study our curriculum and to make recommendations for its improvement, worked diligently for more than one year before making their report. Their recommendations have been intensely studied by the faculty and students and it is planned to start the new curriculum for the first year class entering in the fall of 1969.

An attempt will be made to compress the instruction of essentials of the basic and clinical sciences into a period of approximately two and one-half years, leaving one and one-half years of elective time for the study in depth of the basic and clinical aspects of one or more fields of medicine. It is realized by the students and faculty that the new curriculum will require more work for all of them.

The structure of the administration of the school has been changed to reflect the democratic spirit of the times. All members of the staff with the appointment of Assistant Professor now constitute the faculty of the school. The Executive Committee of the Faculty of Medicine, which now consists of one hundred members, is elected by members of each department. The number on the Executive Committee of the Faculty from each department is related to the size of the department, and the representation for each department includes tenured and non-tenured faculty at various levels.

The students are also paying a more important role in the administration. They now serve on the curriculum committee and student or student-faculty committees which will effect their academic career.

There were no expansions of the school facilities during 1968 but ground was broken and construction started on the addition to Bard Hall and the new apartment houses for the faculty and supporting staff. The plans for the new library are advancing rapidly now that the land has been acquired and the premises almost entirely vacated.

A brief resume of the teaching, research and clinical activities of the school is given in the reports of the various departments.

The registration of the School of Medicine in September, 1968 was as follows:

First Year	135
Second Year	126
Third Year	120
Fourth Year	121
	502

The Committee on Admissions reported an eleven per cent rise in total applications to 1,778 with signs of yet another increase to come. Interviews were requested of 479 applicants of whom 132 were selected for admission.

The entering class came from fifty-four different colleges and twenty-seven states. Eleven were women and nine were children of alumni.

The Committee on Admissions is aware of its obligation to seek larger numbers of students from minority groups and from the ranks of those whose records are lower because of environmental factors and lack of opportunity rather than because of basic endowment and potential. By furthering its techniques to seek out such candidates and to evaluate them meaningfully, it hopes to enlarge their representation among the student body while still maintaining the high standards of scholastic excellence and personal qualifications which characterize this school.

In the School of Public Health and Administrative

Medicine the registration in September, 1968 was as follows:

D.P.H. candidates	3
M.P.H. candidates	43
M.S. candidates	111
Special Students	11

In the Department of Nursing, the registration in September, 1968 was as follows:

First Year	131
Second Year	116

In the Course for Occupational Therapists, fifty-one students were registered in September, 1968. Fifty-two students were registered for the Course for Physical Therapists.

The following degrees were awarded:

M.D.	107
D.P.H.	1
M.P.H.	40
M.S. (Radiologic Physics, Nursing and Public Health fields)	66
B.S. (Nursing, Occupational Therapy, Physical Therapy)	134

It is with the greatest sorrow that we report the following deaths during the year:

Hattie E. Alexander, Professor Emeritus of Pediatrics, Special Lecturer in Pediatrics and Consultant, Presbyterian Hospital, on June 24, 1968

Franz Altmann, Clinical Professor of Otolaryngology retired, Special Lecturer in Otolaryngology and Consultant, Presbyterian Hospital, on August 26, 1968

James W. Babcock, former Clinical Professor of Otolaryngology, on October 23, 1968

F. Randolph Bailey, Clinical Professor Emeritus of Medicine and Consultant, Presbyterian Hospital, on September 20, 1968

Ralph H. Boots, former Associate Clinical Professor of Medicine, and Consultant, Presbyterian Hospital, on October 21, 1968

J. Maxwell Chamberlain, Associate Clinical Professor of Surgery (Roosevelt Hospital), on May 27, 1968

L. Beverley Chaney, Consultant, Neurology, Presbyterian Hospital, on March 12, 1968

William A. Horwitz, Professor of Clinical Psychiatry and Attending Psychiatrist, Presbyterian Hospital, on May 15, 1968

Albert Plentl, Associate Professor of Obstetrics and Gynecology, Associate Attending Obstetrician and Gynecologist, Presbyterian Hospital, on January 11, 1968

Aaron Prigot, Associate Visiting Surgeon, Harlem Hospital, on July 18, 1968

The following retirements, effective June 30, 1968, are reported:

Alexander E. W. Ada, Associate Clinical Professor of Surgery (St. Luke's Hospital)

F. Randolph Bailey, Clinical Professor of Medicine and Attending Physician, Presbyterian Hospital

Elizabeth S. Gill, Professor and Chairman, Department of Nursing and Associate Dean (Nursing), and Director of Nursing Service, Presbyterian Hospital

A. David Gurewitsch, Clinical Professor of Rehabilitation Medicine, Attending Physician, Presbyterian Hospital, and Visiting Physician, Delafield Hospital

Shulamith Kastein, Lecturer in Otolaryngology

Deborah Locatelli-Khorazo, Assistant Professor of Microbiology

George W. McCormick, Instructor in Pediatrics and Assistant Pediatrician, Vanderbilt Clinic

J. Lowry Miller, Clinical Professor of Dermatology and Attending Dermatologist, Presbyterian Hospital

Howard A. Patterson, Clinical Professor of Surgery (Roosevelt Hospital)

Walter S. Root, Professor of Physiology

Maximilian Silbermann, Assistant Clinical Professor of Neurology and Associate Attending Neurologist, Presbyterian Hospital

Florence L. Vanderbilt, Director of Residence and Health, Nursing

Melvin B. Watkins, Associate Professor of Clinical Orthopedic Surgery, Associate Attending Orthopedic Surgeon, Presbyterian Hospital and Associate Visiting Orthopedic Surgeon, Delafield Hospital

Maynard C. Wheeler, Clinical Professor of Ophthalmology

The following emeritus designations, effective July 1, 1968, were made by the Trustees:

F. Randolph Bailey, Clinical Professor Emeritus of Medicine and Consultant, Presbyterian Hospital

Elizabeth S. Gill, Professor Emeritus of Nursing

Walter S. Root, Professor Emeritus of Physiology

The following designation was made on July 1, 1968:

Donald W. King, Delafield Professor of Pathology

The following promotions were made during the year:

Henry Azar, Associate Professor of Pathology

David H. Baker, Professor of Radiology

Harold G. Barker, Professor of Clinical Surgery

Harold Baumgarten, Jr., Associate Professor of Administrative Medicine

Joshua A. Becker, Associate Professor of Radiology

Walter E. Berdon, Associate Professor of Radiology

Martin Blank, Associate Professor of Physiology

Frederic O. Bowman, Jr., Associate Professor of Clinical Surgery

Philip Brandt, Associate Professor of Anatomy

Philip E. Duffy, Professor of Neuropathology

Andrew G. Frantz, Associate Professor of Medicine

Shervert Frazier, Professor of Clinical Psychiatry

Gabriel C. Godman, Professor of Microbiology

llen M. Gold, Associate Professor of Biochemistry
 ejane M. Harvey, Professor of Medicine
 obert B. Hiatt, Professor of Surgery
 rderick G. Hofmann, Professor of Pharmacology
 ustin B. Johnston, Associate Professor of Pathology
 (assigned to Orthopedic Surgery)
 ilia M. Jones, Professor of Clinical Medicine
 athan Lane, Professor of Surgical Pathology
 arles S. Neer II, Professor of Clinical Orthopedic
 Surgery
 arles R. Noback, Professor of Anatomy
 linton P. O'Connell, Professor of Clinical Obstetrics
 and Gynecology
 lliott F. Osserman, Professor of Pathology
 eon Roizin, Professor of Neuropathology (assigned to
 Psychiatry)
 arles T. Ryder, Professor of Clinical Orthopedic
 Surgery
 erbert C. Stoerk, Professor of Pathology
 amilton Southworth, Professor of Clinical Medicine
 raymond L. Vande Wiele, Professor of Obstetrics and
 Gynecology
 alph J. Veenema, Professor of Clinical Urology
 ules G. Waltner, Professor of Clinical Otolaryngology
 Bernard Weinstein, Associate Professor of Medicine
 igmund L. Wilens, Professor of Pathology
 ames A. Wolff, Professor of Clinical Pediatrics

The following new appointments were made during the year:

Mary I. Crawford, Professor of Nursing, Associate Dean
 (Nursing), Chairman of the Department of Nursing
 and Director of Nursing Service, Presbyterian Hos-
 pital
 Eric J. Hall, Professor of Radiology (Physics)
 Richard L. Masland, Professor of Neurology, Chairman
 of Department of Neurology and Director of Neurol-
 ogy Service and Attending Neurologist, Presbyterian
 Hospital
 Maurice V. Russell, Associate Professor of Administra-
 tive Medicine
 Huntington Sheldon, Professor of Pathology
 Henry J. Vogel, Professor of Microbiology (assigned to
 Pathology)
 Keith Waterhouse, Professor of Clinical Urology

The Janeway Prize, awarded to the graduate who, in the opinion of the Faculty, has ranked highest in efficiency and ability was given to Christopher J. McNeill, The Borden Undergraduate Research Award was given to Anthony Nowels for outstanding research work during the medical course. Robert M. Schmidt received the Frederick P. Gay Memorial Award.

The Joseph Mather Smith Prize, awarded to the graduate whose essay or original research in medical subjects is deemed by the Committee on Awards

to be the most meritorious, was given to Dr. Richard Rifkind, Class of 1955. The William Perry Watson Prize in Pediatrics was given to John C. Garrett. The Harold Lee Meierhof Memorial Prize in Pathology was given to Philip K. Peterson. The Helen M. Sciarra Prize in Neurology was given Faye C. Natanblut.

The Joseph Garrison Parker Award was given to Virginia Utermohlen. The Walter Winchester Prize was awarded to Thomas A. Brackbill. The Alumni Association Senior Student Award was given to Jack W. Spitzberg. Sam Siris was given the Medical Students' Thesis Award in Psychiatry. Douglas L. Brand, Ronald Li, Barry I. Liskow and A. John Rush, Jr. were awarded the Urology Prize. The Roche Award was given to Philip K. Peterson, The Pfizer Laboratories Medical Scholarship Award was given to Steven Kohl. Michael P. Coyle, Jr., Anthony Nowels and John J. Daly received the Merck Manual Award.

The Graduate and Postgraduate Programs

Interest in and requests for graduate and post-graduate programs continue at an extremely high level.

During the past year, 411 residents and 36 interns received part or all of their training under the direction of faculty members. In addition, there were 364 trainees and fellows, as well as 168 visiting fellows from the United States and foreign countries.

The postgraduate program offered 41 courses in various fields of medicine for which 1,739 physicians were registered. Almost all of the affiliated hospitals are now participants in this program. Though most courses are directed to those individuals with interests in specialized fields of medicine, courses for those in general practice are also offered. During the past year a variety of programs which focussed on newer techniques of diagnosis and treatment in all branches of medicine were included. In an effort to present these at times least likely to conflict with practicing physicians time commitments, these were scheduled for evening or Sunday mornings. The response to the Sunday seminars presented in collaboration with the Brookdale Hospital Center has been most gratifying and warrants further exploration.

The Doctor of Medical Science program now has eight candidates who have completed various phases of the requirements of the degree.

Student and Personnel Health Service

The Student Health Service has remained under the direction of Dr. Albert R. Lamb, Jr.

During the past academic year 1967-1968, 2,148

patient visits were made to this office, compared with 2,850 the preceding year. In addition, routine physical examinations totaling 418 were performed on all the new students, and on third year students in medicine and dentistry, and routine chest x-rays were obtained on the student body. There were 1,099 visits to the Vanderbilt Clinic made by the students. A variety of other services were provided. These have included a wide range of immunization, the completion of health reports, premarital examinations and insurance forms, and advice and counsel on a great variety of subjects.

The Personnel Health Service has remained under the direction of Dr. Kirby Cunningham.

During the past year 1967-1968, 503 patient visits were made to this office, compared with 860 the preceding year. In addition, pre-employment physical examinations totaling 252 were performed. A variety of other services were provided. These have included immunization, the completion of health reports, premarital examinations and insurance forms.

H. Houston Merritt

H. HOUSTON MERRITT, M.D.

Dean of the Faculty of Medicine

December 31, 1968

Reports of Departments
and Services

Anatomy

EDWARD W. DEMPSEY

Professor and Chairman of the Department

This has been a year of change. Change, long planned, needs careful nurture for success. Thoughtless addition of weighted ornaments can overload a keystone, causing an arch to collapse. Change must be coordinated. Heedless proponents of instant change advocate desired results, but seldom consider methods and almost never think of costs. Responsible planning must couple ways and means to objectives.

As mentioned in last year's report, a reassessment of anatomy in the light of current knowledge indicates a need for introducing the new concepts of cell biology, developmental biology, genetics, biophysics and many other disciplines. Also required is the use of audiovisual and other teaching aids, for the most efficient transmission of facts, ideas, and generalizations. Judgment is needed for the selection of the relevant from the inconsequential. Paramount above all other considerations, and especially required because of the welter of indiscriminate and unevaluated information now common in books, magazines, newspapers, radio, television and even in college courses, is the need to restore an appreciation of the integrated body as the prime functional unit.

Once the subject has been reassessed, plans can be made and funds sought for implementing them. These steps have been made in this department and some progress can now be reported. Our activities can conveniently be related to functions of teaching, of research and of activities related to the affairs of our cultural community, whether local, national

or international. They will consequently be described under these headings.

Teaching Activities

With the flowering of cell biology which has occurred in the last half decade, much of conventional microscopic anatomy and neuroanatomy can now be replaced by material derived from fluorescence, polarizing, phase interference and especially electron microscopy. All of these microscopic methods are now being coupled with chemical, physical and mathematical knowledge, and all are being widely applied to studies of adult and developmental stages in normal, pathological and experimental situations. The standard textbooks have been extensively rewritten. Many concepts, long passionately held and taught, have been abandoned or modified, and more accurate models have replaced them (e.g. the concept that myelin is a fatty secretion, or that diffusion is the principal mechanism involved in transport). Many pathological phenomena are now readily demonstrable (e.g. virus inclusions in cells). We now include routinely such new and pertinent information in our regular courses. We present it in photographs, in lantern slide projections, in cinematography and in closed circuit television. We relate it to normal and diseased conditions relative to the whole body (e.g. the demonstration by Dr. William M. Rogers of contour spectral phonocardiography and cineradiography) of organs and systems, of cells and finally cell organelles.

In addition to our regular courses for medical and dental students, we furnish instruction for a wide variety of students. We teach elective courses for medical and dental students, we present courses in general studies, we have graduate students and students in occupational therapy, in physical therapy, and in postgraduate courses. All of these courses are as continuously evaluated and reorganized as is possible and necessary. One new course has been added during the year as a combined offering and as an elective for medical, dental and graduate students as well as for postgraduate trainees, fellows and staff members. It is a course in cell biology, laying stress upon the physical and chemical bases of cellular phenomena and of the instruments and methods by which they are studied.

Teaching, as one facet of a university department, requires people and facilities. Our cadre of teachers has been strengthened during the year by the addition of Assistant Professors Edmund B. Masurovsky, Letty Salentijn, and Nina Popoff, and of Instructors Farish A. Jenkins, Jr., W. Patrick Luckett and Alfonso Solimene. In addition, two members of our department, Dr. Urbain Van Haelst and Dr. Linda Saland, who hold visiting and research appointments respectively, are sharing in our teaching activities. We have lost, temporarily, the services of Dr. Richard P. Bunge and Dr. Philip W. Brandt, both of whom are on sabbatical leave, and we will also suffer the loss next semester of Dr. William M. Rogers who is retiring in July and will go on leave as soon as he completes his teaching duties during the first semester. Our facilities, as mentioned earlier, have been strengthened by the additional use of audiovisual and television equipment, and in addition we have reconstructed a small room, formerly the Chairman's office, to be a library, conference and seminar room for small-group teaching sessions.

Research Activities

The research of the department has continued on a broadened and accelerated pace during the year. The two new electron microscopes, acquired during the previous year, have now had their shake-down runs and are fully functional, thus increasing our productivity in this field and allowing us to collaborate with colleagues here and abroad and to accept medical students and trainees for research experience. In the former category should be mentioned a joint study of malarial parasites with Dr. Louis Miller (Public Health), a study of fish scales with Dr. Richard J. Krejsa, a former trainee in dental anatomy, an investigation of comparative placental

morphology with Professor E. C. Amoroso of the Royal Veterinary College, London and a joint undertaking on the identification of biogenic amines in adrenergic nerves with Dr. Berndt Ehinger of Lund. In the latter category are eight medical students who have worked with us during the year, Miss Eve Slater, Messrs. George Hill, Robert Lessey, Peter Friedman, Howard Eggers, James Mayer, William Mouradian and John Newman. So far there will be at least four articles resulting from the activities of these students. In the trainee category, there are the Misses Elena Schmidt, Pamela Binnicker, Messrs. Mark Simon, Ernest April, James Colgan, Drs. Ottoheinrich Hase and Robert Howes, all graduate student candidates for advanced degrees. Drs. Linda Saland, Piroska L. Szabo, Ina J. Wundram, Urbain Van Haelst, William O. Whetsell, John Harbison, Walter Hendelman, Joyce Shriver and Nina Popoff all were post-doctoral trainees obtaining research experience. Of this last group, Dr. Szabo has accepted a position at the Medical College of Virginia, Dr. Wundram will return to Emory University School of Medicine, Dr. Van Haelst to Nijmegen, Dr. Hendelman has accepted a position at the University of Ottawa, Dr. Shriner at the Mount Sinai School of Medicine, and Dr. Popoff on the staff here. The others remain in training. We have, in addition to these, collaborated in research training and research projects with Drs. Paul Richter of Neurology, Jacqueline Bartman of Pediatric Pathology, Paul Brown of Obstetrical Pathology, Austin Johnson of Orthopedic Pathology, Peter Carmel and Bennett Stein of Neurosurgery, Robert Jack of Ophthalmology, Robert Waldron of Radiology and Seymour Lieberman of Biochemistry, all from this institution.

Research, as well as teaching, requires people and people require laboratories. With no additional space available, it has been necessary to renovate the space we have for more efficient use. Despite difficulties in obtaining money for such purposes we have been able to renovate six rooms and to consolidate activities sufficient to accommodate the additional staff and we are now proceeding with similar refurbishing in an additional six rooms.

In addition to continuing programs in neuroanatomy, reproductive physiology, developmental biology, cytology, and dental anatomy mentioned in last year's report, extensive activities are carried out by Dr. George K. Smelser, assigned to Ophthalmology, Dr. Margaret R. Murray, assigned to Surgery and Dr. Frederick A. Mettler, assigned to Neurology. Detail concerning these programs are evident from the attached bibliography. Dr. Farish

A. Jenkins, Jr., new to the department, brings added breadth with his interest in vertebrate paleontology, Dr. W. Patrick Luckett's studies in comparative placentology strengthens the program of the department in reproductive histophysiology and Dr. Masurovsky's experience in radiation biology brings new depth to our studies in cellular biology.

Extra Departmental Activities

As in previous years, there has been active participation in national and international meetings and in receiving various awards, appointments and honors which attest the respect afforded by their colleagues to the various members of the department. We have also participated in local meetings and presentations designed to disseminate information widely to scientists and physicians.

An International Conference on Vertebrate Paleontology has taken Dr. Jenkins to Mexico City; Dr. Brandt is spending a sabbatical leave with Dr. Heinz Holter at the Carlsberg Laboratories in Copenhagen, and Dr. Bunge is in Boston with Dr. Edward Kravitz of Neurobiology on a similar leave. Dr. Melvin Moss presented the Northcroft Memorial Lecture in London and lectured also at Queens University in Belfast. Dr. Herbert O. Elftman travelled extensively in Europe, Canada and the United States for the Committee on Prosthetics Research and Development of the National Research Council, of which he is Chairman. Dr. J. Michael Bedford presented an invited paper at the Society for the Study of Fertility at Newcastle. Dr. Edward Dempsey made site visits to laboratories in Scandinavia, England, Yugoslavia and Japan for the Association for the Aid of Crippled Children, gave invited papers at the Second International Workshop in Teratology in Kyoto and at the International Symposium on the Biology of Reproduction in Mammals in Nairobi. Dr. Luckett also presented a paper at the latter meeting after which he visited laboratories in Yugoslavia and Holland.

Members of the department serve as associate editors for various professional journals. Dr. Malcolm B. Carpenter serves on the Board of *Neurology* and the *American Journal of Anatomy*. Dr. Elftman's name is on the masthead of *Artificial Limbs* and the *Journal of Biomechanics*. Dr. Smelser serves the boards of *Investigative Ophthalmology* and *Experimental Eye Research*. Dr. Bedford has recently been appointed to the editorial board of the newly formed journal *Biology of Reproduction* and Dr. Dempsey serves the boards of *Experimental Neurology* and the *Journal of Histochemistry and Cytochemistry*. Dr. Charles R. Noback is editor of

a new series, *Advances in Primatology*.

In addition to the previously mentioned National Research Council Committee of which Dr. Elftman is Chairman, members of the department serve many national groups. Drs. Carpenter and Bunge are members of the Neurology A and B Study Sections of the National Institutes of Health, respectively. Dr. Smelser is a member of the Vision Research Training Committee of the National Institutes of Health and a trustee of the Association for Research in Ophthalmology. Dr. Sara Luse is a member of the Research Review Panel of the National Multiple Sclerosis Society and is also on the Anatomy and Pathology Fellowships Review Committee of the National Institutes of Health. Dr. Carpenter is a member of the Medical Advisory Board of the Parkinson Disease Foundation and both he and Dr. Dempsey are advisors to the Columbia University Press. Dr. Brandt received a Career Research Development Award from the National Institutes of Health and a Fellowship from the Guggenheim Foundation. Dr. Dempsey is a member of the National Advisory General Medical Sciences Council and liaison member of the National Regional Medical Programs Council, both of the United States Public Health Service. He also serves the Scientific Advisory Panel of Research to Prevent Blindness and the Jury of the Lasker Award. He is a staff associate for the Association for the Aid of Crippled Children and consultant on cell biology to the National Institute of General Medical Sciences.

During the past year, Dr. Melvin L. Moss has accepted the additional and great responsibility of the Deanship of the School of Dental and Oral Surgery, a position greatly enhancing his contributions to the affairs of our community, both intellectually and geographically. Dr. Noback has organized a conference under the auspices of the New York Academy of Sciences entitled "Comparative and Evolutionary Aspects of the Vertebrate Central Nervous System", and Dr. Rogers organized a similar conference, also under Academy auspices, entitled "New Concepts in Assessment and Management of Aortic Valve Disease." In addition, Dr. Rogers' contributions in this field were the subjects of an article in the *Stethoscope* of April, 1968 and of a television medical research program broadcast over the Network of the National Broadcasting Company.

Acknowledgments

The research carried on in the department has been made possible with funds provided by many

public and private foundations, agencies, companies and individuals. Support has been received from the American Cancer Society, the Damon Runyon Memorial Fund, the Sinsheimer Fund, the Lillia Babbitt Hyde Foundation, the China Medical Board, the National Multiple Sclerosis Society and the Association for the Aid of Crippled Children. The Upjohn Company has made a grant toward

research in diabetes. We have received grants from the National Heart Institute, the National Institute for Neurological Diseases and Blindness, and the National Institute of General Medical Sciences. Special fellowships were provided through the National Institute for Neurological Diseases and Blindness, the Vivian B. Allen Foundation and the Katholieke Universiteit Te Nijmegen.

Anesthesiology

EMANUEL M. PAPPER

Professor and Chairman of the Department • Director of Service

Dr. Emanuel M. Papper, Professor and Chairman of the Department, served as President of the American Society of Anesthesiologists. He continued as Chairman of the Program Project Committee of the National Institute of General Medical Sciences and civilian consultant in anesthesiology to the three military services. He also served on the Committee on the Interplay of Engineering with Biology and Medicine, National Academy of Engineering, and was Chairman of the Panel on Anesthesiology of the Drug Efficacy Study Committee of the National Academy of Sciences.

Dr. Papper was elected to Fellowship in the American College of Physicians. As Chairman of the delegation of the American Society of Anesthesiologists he attended the Fourth Congress of the World Federation of Societies of Anesthesiologists in London, and led a panel discussion on the pharmacokinetics of gaseous anesthetics. He also attended the joint meeting of the Portuguese-Brazilian Societies of Anesthesiologists in Lisbon. He served as Visiting Professor at the University of Washington School of Medicine, Buffalo University, and at Queens University in Kingston, Ontario.

Dr. Lester C. Mark returned from sabbatical leave, during which he was Visiting Professor in the Department of Anesthesiology at Sapporo Medical College, Japan, under the sponsorship of the China Medical Board. He also served as Visiting Professor in the Departments of Anesthesiology at Kyoto University, Tokyo University and other institutions in Japan, Korea, Taiwan and Thailand. Dr.

Mark was appointed to the Pharmacology-Toxicology Review Committee of the National Institute of General Medical Sciences and the Food and Drug Administration Advisory Committee on Respiratory and Anesthetic Drugs. He was also appointed to the Editorial Board of Pharmacology and Therapeutics in Dentistry and was named counsellor of the Cancer International Research Cooperative in New York City.

Dr. Robert M. Epstein served as Chairman of the Committee on Scientific Program of the American Society of Anesthesiologists and arranged the scientific program for the 1968 annual meeting of this society. He will continue as a member of its Committee on Scientific Program and Chairman of its Committee on Research. Dr. Epstein continued his work on the Anesthesiology Training Committee of the National Institute of General Medical Sciences.

Dr. Shih-Hsun Ngai was appointed to the Editorial Advisory Board of the International Journal of Neuropharmacology. He lectured to the Twentieth Postgraduate Assembly of the New York State Society of Anesthesiologists and the annual meeting of the Massachusetts Society of Anesthesiologists. Dr. Gabriel G. Nahas spoke before the International Conference on Resuscitation in France, and the Committee on Plasma and Plasma Substitutes, National Academy of Sciences, National Research Council.

Dr. Ronald L. Katz began in September a sabbatical leave as a Guggenheim fellow at Hammersmith Hospital and The Royal Postgraduate Medical

School in London. He is working with Professor J. P. Schillingford of the Department of Medicine and Professor J. Gordon Robson of the Department of Anaesthetics. Dr. Richard J. Kitz was on sabbatical leave as a special research fellow sponsored by the National Institute of General Medical Sciences. He was Visiting Scientist in the Department of Toxicology, The Royal Caroline Institute, Stockholm, under the direction of Professor Bo Holmstedt.

Dr. Lubos Triner was promoted to Assistant Professor and appointed Senior Investigator of the American Heart Association. Drs. Walter C. Bernards, Paul M. Nonkin and Daniel M. Philbin joined the attending and teaching staff. Dr. Igal Staw, an engineer, Dr. Harry Cohen, who is both an obstetrician and anesthesiologist, and Dr. Atsuo Fukunaga of Tokyo University have joined the research staff. Dr. Hisayo O. Morishima has returned after spending two years in the Department of Anesthesiology, University of California Medical Center at San Francisco. Dr. Anthony J. Salvatore completed his research traineeship and is now fulfilling his military commitment.

Dr. Ian C. Geddes, Senior Lecturer in Anaesthetics, University of Liverpool, completed one year as Visiting Professor and returned to England. Dr. Jacques Pieri, Professor of Molecular Biology at the University of Nantes, France and Dr. Jean-Pierre Kleisbauer of the Department of Biochemistry, Faculty of Medicine at Marseille, returned to their respective institutions upon the completion of their collaboration in research with Dr. Gabriel G. Nahas of this department. Dr. Jindrich Kypson resigned to accept an appointment of Assistant Professor of Pediatrics at Albert Einstein College of Medicine. Dr. Sheila G. Haworth has completed two years of research fellowship with Dr. L. Stanley James and returned to England. Dr. Sonja Sarcia, after completing one year of fellowship, will return to the Philippines.

Teaching

The undergraduate teaching continues as a three week clerkship coordinated by Dr. Charles Wolf. The third year medical students learn the principles of resuscitation, care of the unconscious patient and some aspects of practical clinical anesthesia.

The postgraduate training program in clinical anesthesia and research continues to attract a large number of medical graduates from this country and abroad. Clinical teaching improved considerably by extension of the "unit" system throughout the medical center. Permanent assignment of teaching

staff to each operating unit assures superior patient care and bedside teaching. The didactic program has been reorganized to provide a more extensive coverage of basic knowledge relevant to anesthesiology.

Patient Care

During the past year further experience has been gained by the group under the direction of Dr. L. Stanley James with fetal scalp blood sampling to monitor the fetal acid-base status during labor. The fetal acid-base status correlates significantly with the infants condition at birth. This information is now being applied clinically. A repeated low pH value serves as one of the indications for terminating labor by cesarean section if the fetus cannot be delivered per vaginam.

A combined procedure of hypothermia and elective cardiac arrest has been developed by Drs. Aaron Gissen and Richard Matteo with staff members of the Departments of Neurological Surgery and Surgery, for the anesthetic-surgical management of certain cerebral aneurysms.

The safety of laparoscopy, involving pneumoperitoneum with a large volume of carbon dioxide under pressure, has been evaluated by Drs. Robert Baratz and Joannes Karis. Normal blood gases can be maintained by hyperventilation with oxygen-rich anesthetic mixtures.

The surgical intensive care and respiratory care unit, approved in 1966, is still in the planning stage. An adequate facility with properly trained personnel is in constant need for those critically ill patients in the medical center.

The clinical blood gas laboratory operated by the Department of Anesthesiology continues to serve all clinical departments except the Pediatric Service. During the past year 7,500 measurements have been made, an increase of 50% above the previous year.

Compilation of patient care records has been facilitated by a revised computer program for the new 360/75 computer at Columbia University.

In 1968, 21,961 patients were attended by physicians of the Anesthesiology Service. General anesthesia was administered to 17,435 patients and regional anesthesia to 4,529. 263 patients were seen in consultation with reference to proposed treatment or resuscitation measures. Diagnostic or therapeutic nerve blocks were performed on 61 patients.

Research

Studies on fetal physiology and pharmacology continue under the direction of Dr. James (Pediatrics-Anesthesiology). Chronic animal preparations

in pregnant sheep, goats and baboons have been used. This group of investigators has examined the development of fetal hypoxia and acidosis during strong uterine contractions induced by oxytocin.

Drs. Mieczyslaw Finster and Paul Poppers, in collaboration with Drs. Richard M. Welch and Allan H. Conney of the Wellcome Research Laboratories, found that microsomal enzyme (3, 4 benzpyrene hydroxylase) induction occurs in the human placenta among cigarette smokers. A possible test for protection against cancer associated with smoking was thereby explored. This same group of investigators also collaborated with Drs. James Wolff and Harold Maurer (Pediatrics). Enzyme induction by pretreating pregnant women with phenobarbital appears to hasten the maturation of glucoronyl transferase system in newborns. The serum bilirubin levels of infants from pretreated mothers are significantly lower than those of controls. This finding may be useful in the prevention of kernicterus.

This group of workers with Dr. Howard Gordon (Obstetrics and Gynecology) showed that placental transfer of the local anesthetic mepivacaine, after paracervical block, occurs to a significant degree.

Dr. Finster studied the fetal and placental uptake of thiopental in guinea pigs in collaboration with Dr. James M. Perel (Biochemistry).

Drs. Allen I. Hyman, Leonard Brand and Lester C. Mark studied the uptake of thiopental by the brown fat as compared with that by the yellow fat in newborn rabbits.

Dr. Poppers is studying the means to prevent methemoglobinemia formation due to the administration of prilocaine.

Drs. Hisayo O. Morishima and Salha Daniel completed a study on the intrauterine growth of guinea pigs and fetal acid-base balance as related to that of the mother and to the clinical condition of the newborn.

Dr. Robert A. Baratz studied the effect of alcohol on antidiuretic hormone (ADH) and uterine activity in pregnant monkeys, in collaboration with Drs. Karlis Adamsons, Kotaro Suzuki and Terusada Horiguchi (Obstetrics and Gynecology).

The biochemistry and physiology unit under the direction of Dr. Gabriel G. Nahas continues to study the effect of acidosis on carbohydrate and lipid metabolism.

These investigators also observed that ouabain inhibits catecholamine-activated lipolysis, probably through the steps of cyclin 3', 5'-AMP formation and of conversion of inactive to active lipase. They also studied the hypoglycemic effects of ouabain,

which are similar to the action of insulin and propanolol, probably due to their common action on adenyl cyclase and cyclic 3', 5'-AMP formation.

The effectiveness of fluid gelatin in treating hypovolemia from massive hemorrhage has been evaluated in dogs in collaboration with Dr. David V. Habif (Surgery). Drs. Habif and Nahas have also studied the protein sparing effect of various parenteral fluids in human subjects.

Dr. S. H. Ngai continues his study on norepinephrine (NE) and serotonin (5-HT) metabolism with Drs. Robert C. E. Lin, Erminio Costa (Pharmacology-Neurology) and Norton H. Neff (Pharmacology-Neurology). They have developed new methods to measure the rate of synthesis of these biogenic amines, using the radioactive precursors ^{14}C -tyrosine or ^{14}C -tryptophane. Dr. Ngai also studied the effect of carbon dioxide on NE synthesis. The uptake of ^3H -NE by the rat heart has been studied. Cyclopropane and halothane do not change the heart NE level nor the NE uptake.

Drs. Ronald L. Katz and Kenneth E. Eakins (Ophthalmology), together with Dr. Costa, found that pentobarbital anesthesia does not change the turnover of norepinephrine on the peripheral adrenergic nerves. Hypothermia, if it occurs during anesthesia, decreases the turnover rate of NE as measured by the efflux of ^3H -NE.

Dr. Shirley Markee continues her studies on the interaction between monoamine oxidase inhibitors and narcotics in dogs. The possible effect of these inhibitors on the release and metabolism of histamine is being examined.

Dr. Robert M. Epstein studied the effect of anesthetics on the circulatory control systems by measuring the efferent splanchnic nerve impulses in cats. The discharge pattern was correlated with changes in splanchnic blood flow. Cyclopropane does not appear to increase the sympathetic outflow in this preparation.

Dr. Llynda M. Hinds is evaluating the antiarrhythmic activity of bretylium in cats. She is also studying the mechanism of action of dopamine and the effect of reserpine and cocaine pretreatment on dopamine action.

The antiarrhythmic actions of stereoisomers of H 56/28 (a beta-adrenergic blocking agent) have been examined by Dr. Katz in collaboration with Drs. Eakins and Clyde O. Lord.

In the area of molecular pharmacology Dr. Kitz has completed a series of studies on the synthesis and anticholinesterase activity of methanesulfonyl derivatives of quinolium and isoquinolium in col-

boration with Drs. Sara Ginsburg (Neurology) and John F. Ryan. While at the Royal Caroline Institute Dr. Kitz was a member of the team which chemically identified the presence of acetylcholine in cerebral tissue.

The development of new short-acting, non-depolarizing neuromuscular blocking agents continues in collaboration with Drs. Ginsburg and Joannes H. Karis.

Dr. Ryan is collaborating with Drs. Kitz and Leon Kremzner (Biochemistry-Neurology) in the purification of human plasma cholinesterase.

Dr. Karis continues his collaboration with Dr. William B. Nastuk (Physiology). In single fiber preparations the action of neostigmine and its methyl analogue on the postjunctional membrane has been compared.

Dr. Aaron J. Gissen has examined the effect of germine diacetate (GDA) on frog nerve-muscle preparations with Dr. Nastuk. Dr. Gissen also compared the postjunctional effect of decamethonium and carbochol. Clinical studies on the neuromuscular transmission as affected by muscle relaxants and their antagonists are being continued by Drs. Gissen and Karis.

Dr. Katz, together with Dr. Eakins, studied the mode of action of succinylcholine in intraocular pressure. Dr. Katz studied the neuromuscular effects of germine diacetate (GDA) in vivo in collaboration with Dr. Werner E. Flacke of the Harvard Medical School.

Dr. Katz also studied the effects of pilocarpine, atropine, anticholinesterases and sympathomimetic drugs on salivary secretion and composition in collaboration with Dr. Irwin Mandel (Stomatology).

Drs. Anthony J. Salvatore and Stuart F. Sullivan have confirmed the phenomenon of posthyperventilation hypoxia in man. Drs. Sullivan and Daniel M. Philbin studied the role of low cardiac output in postoperative hypoxemia in patients after cardio-pulmonary bypass.

Dr. Paul M. Nonkin, in collaboration with Drs.

Paul Cannon and Margaret Kilcoyne (Medicine) is studying the nutrient blood flow to the renal cortex and juxtamedullary tissue in dogs using ¹³³Xenon.

Drs. Herbert Rackow and Ernest Salanitre continue their work on the pharmacokinetics of anesthetic gases and vapors. Their studies have been extended to infants and children.

Dr. Ian C. Geddes, in collaboration with Drs. Mark, Brand and Finster of this department, and Drs. Eugene P. Cronkite, Stanton H. Cohn and Jean R. Scherrer of the Brookhaven National Laboratory, has prepared ⁸²Br-halothane by neutron activation. Purified ⁸²Br-halothane has been used to study its distribution, metabolism and placental transfer in experimental animals with conventional scintillation techniques, and its uptake and distribution in man using a 54-channel whole body counter.

Dr. Michael N. Ashman is developing a non-linear analog computer model simulating the uptake of anesthetics in man, with particular reference to the "over-pressure" during induction and the circulatory changes which influence the anesthetic uptake. Dr. Ashman is being advised in his work by Dr. Robert M. Epstein and Professor William B. Blesser (Biomedical Engineering, Polytechnic Institute of Brooklyn).

In collaboration with Dr. Takeo Takahashi (Sapporo Medical College, Japan) Dr. Mark studied the cellular uptake and subcellular distribution of ³⁵S-thiopental.

Dr. Richard S. Matteo, in collaboration with Dr. Leon Kremzner, studied the effects of known hepatotoxins on the hepatic content of spermidine, a polyamine closely related to nucleic acid metabolism and protein synthesis. Change in tissue spermidine levels, a sensitive index for reparative process after cellular injury, is being used to assess the hepatotoxicity of general anesthetics. The turnover of spermidine in the liver from rats exposed to hepatotoxins and general anesthetics is also being studied, using radioactive putrescine as the precursor.

Biochemistry

DAVID RITTENBERG

Professor and Chairman of the Department

Instruction in biochemistry has been given to the medical and dental students as well as forty-two graduate students in the Faculty of Pure Science. Ph.D. degrees were awarded to four students.

The following staff members resigned to accept positions elsewhere, or to return to their respective institutions: David Shemin, Erich Hirschberg, Rivka Rudner, John Hay, D. L. Nandi, Abraham Rosenberg, and B. Magdoff-Fairchild.

During the year, Dr. Allen M. Gold was promoted to Associate Professor and Dr. Walo Leuzinger to Assistant Professor. Drs. Peter Eggena, Era Cassuto, Anna F. Wu, Cara Lynne Schengrund, Roger Simkin and Howard F. Bunn were promoted to the rank of Research Associate.

Research

Drs. Reinhold and Ruth Benesch continued their investigations on their discovery that certain phosphate esters from the human red cell are the primary regulators of oxygen release from hemoglobin to the tissues. In this work they have been assisted by Miss Chi Ing Yu and Miss Margaret Green. Dr. Walter Gratzer from the Department of Biophysics, King's College, London, England, was a visiting professor in the laboratory during the second semester.

Dr. Ernest Borck and his associates have continued their studies of enzymes which modify nucleic acid. The finding of altered activities of such enzymes in tumor cells first reported from these laboratories has now been confirmed and ex-

tended by several groups of workers. Moreover the presence of novel species of transfer RNAs in tumor tissues has also been demonstrated. The findings establish qualitative differences between normal and tumor tissues. Dr. Borek gave lectures in Manchester, Glasgow, before the National Cancer Research Institute of Paris, the National Cancer Research Institute in Washington, D. C. and at the annual M.D. Anderson Hospital Conference in Houston.

Dr. Chargaff continued his studies on the chemistry and biochemistry of the nucleic acids and some of the enzymes taking part in their synthesis and modification. Work was done on the transcription of DNA by RNA polymerase, on the mode of action of the latter, on the separation of denatured DNA into complementary strands, on the mechanisms of microbial transformation, on the role of base-pairing in the control of enzyme reactions, and on the kinetics of nucleoside phosphotransferases. Participating in this work were Drs. Karkas, Rudner and Shapiro, as well as Drs. Elinor F. Brumley, E. Cassuto, L. Cheong and A. Wu. M. S. E. M. Hoffman and Mr. Edward Chin render technical assistance. Dr. Rudner has now left the group, having been appointed Associate Professor of Biology at Hunter College.

Dr. Max A. Eisenberg and his associates have continued studies on biotin biosynthesis with *E. coli* mutants, enabling them to map a large segment of the Biotin locus. It has also been possible from the genetic and biochemical studies to formulate a pa-

ay for the biosynthesis of biotin.

Dr. Jay A. Glasel continued with his studies on the application of nuclear magnetic resonance to biochemistry.

Dr. Allen M. Gold is continuing his studies on the structure and function of the enzyme glycogen phosphorylase, which plays a key role in the regulation of carbohydrate metabolism in muscle. Kinetic studies designed to elucidate the mechanism of action of the enzyme are being carried out in collaboration with Dr. J. Tseng and Mr. R. Johnson, while structural studies on the enzyme molecule are being done with Mr. D. Blackman. A parallel investigation of a closely related enzyme from potatoes is being done in collaboration with Mr. G. Sanchez.

The Biochemistry laboratory at the Francis Delafield Hospital (Dr. Samuel Graff, et al) is pursuing its work on interferon, a species-specific anti-viral protein with therapeutic promise. The laboratory has now undertaken the production of human interferon on a scale sufficient for clinical trial.

Dr. Alvin I. Krasna, with the assistance of Mrs. Rita DeLeo, has continued to study the chain separation in DNA on denaturation. Using low-angle light scattering, the effect of chemical methylation of DNA on its physiochemical and biological properties has been investigated with Mr. Elliot Uhlenhopp. With Dr. Cara Schengrund, the hydrogenase of *Proteus vulgaris* was purified and the mechanism of its activation by light was investigated. The nature and properties of the hydrogenase of *Chromatium* and *Scenedesmus* was studied in collaboration with Miss Ellen Feigenblum and Mr. Peter Gitlitz.

Dr. Barbara W. Low and her collaborators have continued their studies of insulin, oxytocin, ceruloplasmin and transferin. The molecular weight of human ceruloplasmin has been determined with Drs. Magdoff-Fairchild and Lovell. An extensive series of structure studies of peptide fragments from insulin and oxytocin has been initiated with Drs. David Dexter, F. Maurice Lovell and James Van der Veen and with Mr. Andrew Rudko, a graduate student. Dr. van der Veen is visiting the laboratory on sabbatical leave from the Stevens Institute. In collaboration with Dr. Peter Eggena, work on the structure of an oxytocin salt has been initiated. With Dr. Roger Simkin and Mr. Stephen Cole, a fourth year medical student, interactions between insulin-lysozyme and insulin protamine have been characterized, and two new crystalline forms of insulin prepared. Dr. Low has developed, with Dr. Lovell and Mr. Rudko, a model for the prediction of the helical regions of proteins. With Dr. Hitoshi Ozawa and

Dr. W. Wardle Fullerton, chemical modification studies of insulin have been undertaken. Dr. Ozawa has developed new reagents for the preparation of heavy atom derivatives of insulin.

Dr. David Rittenberg spent the academic year on sabbatical leave at the Departments of Biochemistry at the University of California in Los Angeles and Imperial College of Science and Technology in London. During this period he developed a method for the determination of specific positions of O¹⁸ in the hydroxyl groups of ribose. He completed a research with Dr. Peter Model on the interaction of aldolase with its substrate fructose diphosphate. Mr. Richard Caprioli, a graduate student of this department, continued his study on the biochemical mechanism of the formation of ribose in ribonucleic acid.

In collaboration with Dr. Laura Ponticorvo, Dr. Rittenberg continued his studies of the abundance of deuterium in natural products. In particular, he determined the deuterium concentration of alcohol isolated from French wine, and studied the kinetics of isotope fractionation in the alcoholic fermentation of glucose.

Dr. David J. Smith has continued his investigations on collagen fiber maturation *in vitro*. The biochemistry course for dental students was taught in the Spring semester with the assistance of Dr. Horace B. Gillespie.

Dr. David B. Sprinson and his collaborators have continued investigation of the enzymology and regulatory mechanisms of aromatic bio-synthesis in bacteria. Dr. Edith Gollub has studied the properties of a new operon comprising the *tyr*, *aroF*, and fluorophenylalanine resistance genes, and responsible for regulating the biosynthesis of tyrosine. Dr. Mella Adlersberg continued her synthetic studies of intermediates in 5-dehydroquinate formation. Dr. Jean Dayan has explored various methods of stabilizing and purifying the chorismate mutase-prephenate dehydrogenase aggregate of *Salmonella*. Dr. John Vnek has studied the levels of dehydroquinate synthetase as a function of the growth cycle of *Salmonella* and *E.coli*. Mr. DeLeo has purified the tyrosine specific DAHP synthetase and studied the mechanism of the reaction between its substrates, enolpyruvate phosphate and erythrose 4-phosphate. Mr. Rotenberg has studied the mechanism of 5-dehydroquinate synthetase.

Dr. Parithyachery R. Srinivasan and his associates have continued their investigations on the biosynthesis of anthranilic and p-aminobenzoic acids as well as the biological function of methylated bases in nucleic acids. Dr. Hadassah Tamir has purified

the enzyme anthranilate synthetase 200 fold and is studying the mechanism of conversion of chorismate to anthranilate by the enzyme. Dr. Baliga has demonstrated the presence of novel species of tRNA for histidine, tyrosine and asparagine in Novikoff hepatoma tissue as compared to normal liver. The codon responses of these new species of tRNA are under investigation. Dr. Srinivasan spent his sabbatical leave in the laboratories of Dr. R. Dulbecco, Salk Institute where he studied the state of viral DNA in transformed cells.

The revised biochemistry curriculum this semester has permitted electives in laboratory experiments and seminar topics. This has been received with great enthusiasm by our medical students.

The departmental seminars were addressed by many distinguished visitors, among whom were: Dr. S. J. Singer, Revelle College; Dr. Bruce N. Ames, National Institute of Health, Arthritis and Metabolic Diseases; Dr. Uriel Bachrach, Hebrew University; Dr. Walter Gilbert, Harvard University; Dr. J. W. Cornforth, Milstead Laboratory of Chemical Enzymology; Dr. Carl E. Cori, Massachusetts General Hospital; Dr. John M. Buchanan, Massachusetts Institute of Technology; Dr. Jan Drenth, University of Groningen; Dr. J. Hay, University of

Glasgow; Dr. Jerome R. Vinograd, California Institute of Technology; Dr. W. Wallace Cleland, University of Wisconsin; Dr. John Foulds, Stanford University; Dr. Donald Crothers, Yale University; Dr. Jesse C. Rabinowitz, University of California; Dr. Masayuki Katagiri, University of Illinois; Dr. David E. Green, The University of Wisconsin; Dr. Jack L. Strominger, University of Wisconsin Medical Center; Dr. Gyoergy Pitaki, Robatharus Company; Dr. Nathan Sharon, Weizmann Institutes of Science; Dr. Rivka Rudner, Hunter College; Dr. Edwin G. Krebs, University of Washington and Dr. Philip Leder, National Cancer Institute.

Acknowledgment

The activities of the department received support during the year through grants from the American Cancer Society, the American Heart Association, the Atomic Energy Commission, the Damon Runyon Memorial Fund for Cancer Research, E. duPont de Nemours and Company, the Health Research Council of New York, the Office of Naval Research, the National Institutes of Health of the United States Public Health Service, the National Science Foundation and the Rockefeller Foundation.

Dermatology

CARL T. NELSON

Professor and Chairman of the Department • Director of Service

Teaching

The undergraduate curriculum and the training program for residents and fellows in dermatology underwent no major revisions during 1968. It seems likely, however, that changes in the undergraduate curriculum contemplated for the near future will bring about extensive revisions in our methods of instruction. Certainly the service aspects of the out-patient clinic will be combined more and more with both the undergraduate and graduate teaching functions of the department.

Changes in Staff

Dr. J. Lowry Miller, Clinical Professor of Dermatology and Attending Dermatologist, reached retirement during the year. Dr. Miller has been a distinguished teacher and clinical investigator in this department for thirty-eight years and served as chief of the dermatological out-patient clinic for twenty years. We are very fortunate that he will continue as Consultant Dermatologist and Special Lecturer.

Dr. Kenneth O. Lloyd was appointed Assistant Professor of Biochemistry, assigned to Dermatology. Other appointees to the staff during the year were Dr. Louis Fragola as Assistant in Dermatology and Drs. Jack Rosen and Luis Suarez-Reyes as Assistant Dermatologists in Vanderbilt Clinic.

Promotions, effective July 1, 1968, include those of Dr. Lewis Shapiro to Associate Clinical Professor; Dr. Irene Weitzman to Assistant Professor and Dr. Peter C. Lombardo to Instructor. Dr. Lom-

bardo and Dr. William G. Atwood became Assistant Attending Dermatologists in The Presbyterian Hospital and Dr. Eugene W. Sweeney was promoted to Assistant Attending Dermatologist in Vanderbilt Clinic.

Staff Honors and Activities

Dr. Helen O. Curth was elected Chairman of the Section on Dermatology of the New York Academy of Medicine and Dr. Anthony N. Domonkos again served as Treasurer of the American Dermatological Association. Dr. Paul Gross received a citation from the Medical Society of the State of New York to mark his fiftieth year in the practice of medicine. Dr. Lloyd received a Research Career Development Award from the United States Public Health Service, effective July 1, 1968.

Dr. J. Lowry Miller continued as Treasurer of the Dermatology Foundation, Inc. and Dr. Nelson again served as a member of the Board of Directors of the American Dermatological Association. Dr. Margarita Silva-Hutner continued as a member of the Technical Advisory Committee of the American Type Culture Collection and Dr. Irene Weitzman was elected Chairman of the Committee on Medical Mycology of the Mycological Society of America. Dr. Silva-Hutner delivered a series of eight lectures on medical mycology to the dermatology staffs of the Johns Hopkins Hospital and the Walter Reed Army Hospital. In December, Dr. Silva-Hutner also gave the tenth annual lecture in memory of Dr. Bailey K. Ashford at the University of Puerto Rico.

Patient Care

During 1968 out-patient visits to dermatology totaled 24,105. There were 128 admissions to the dermatology ward and 660 additional in-patients were treated in consultation with other services. The mycology laboratory examined 3,811 specimens and the serology research laboratory carried out 207 specific treponemal tests for patients admitted to the various services of the Medical Center.

The long-term decrease in the number of patient visits to dermatology in Vanderbilt Clinic, remarked upon in previous annual reports, seems to have finally stopped during the past two years. This is encouraging to the teaching staff since the out-patient clinic provides almost all of the teaching material for our medical students and house staff. With the coming revision of the curriculum designed to allow more elective time in dermatology for students during their clinical years, it is clear that large numbers of ambulatory patients with skin disease will be needed to supply sufficient cases of teaching value.

Research

Drs. Atwood and Miller continued their investigation of the characteristics of the immunoglobulin response in patients with the late stages of syphilis. Dr. Anthony N. Domonkos studied further the effectiveness of 5-fluorouracil in the treatment of actinic keratoses and carcinomas of the skin.

Mrs. Julia M. Einbinder and Dr. Richard A. Walzer continued their study of the physiologic and biochemical mechanisms of cellular cohesion, utilizing tissue culture techniques. With Dr. Lombardo, Mrs. Einbinder completed an investigation of the

phagocytic activity of circulating neutrophiles in sarcoidosis. Dr. James P. Fields, in collaboration with Dr. Ward Bullock of the University of Rochester, initiated a study of the immunopathology and the abnormal immunoglobulins in patients with lepromatous leprosy at the United States Public Health Service Hospital, Staten Island. Drs. Theodore A. Labow, Jack Eisert and Saul L. Sanders completed their evaluation of the efficacy of corticosteroid-impregnated occlusive tape in the local treatment of psoriasis. Dr. Lloyd has initiated an investigation of the immunochemistry of complex carbohydrates, including polysaccharides and glycoproteins derived from some pathogenic fungi.

Dr. Silva-Hutner, in collaboration with Dr. Celina Roitman, Research Fellow of the CAPES-Ford fund of the Brazilian government, continued a study of the bacteria in clinical specimens that induce the formation of yeast protoplasts. Dr. Irene Weitzman investigated further the genetics and cytology of dermatophytes and related fungi. Dr. Alexander W. Young, Jr. continued his study of the pattern of exfoliative cytology in patients with local and systemic diseases of the skin.

Acknowledgments

The Department of Dermatology gratefully acknowledges the support given its research program during 1968 by the Brown-Hazen Fund of the Research Corporation, the Robert Sterling Clark Foundation, Mr. James J. Culhane, Duke Laboratories Inc., Dr. Elizabeth L. Hazen, Hoffman-La Roche Inc., Mr. Arthur Ross, Schering Corporation and various agencies of the National Institutes of Health of the United States Public Health Service.

Medicine

STANLEY E. BRADLEY

Bard Professor and Chairman of the Department • Director of Service

The past year has been one of drastic and far-reaching change for the Department of Medicine. The department terminated its century-long association with Bellevue Hospital on July 1, 1968 when the First (Columbia) Medical Division was turned over to New York University School of Medicine. Most of the clinical staff joined the Medical Service at Harlem Hospital Center. In his new capacity as Chief of the Harlem Medical Service, Dr. Charles A. Ragan has succeeded in recruiting a full house staff consisting of 23 straight medical interns, 11 rotating interns, 14 first year residents, 7 second year residents, one third year resident, and a chief resident, all but one of whom have been trained in American medical schools. Efforts are being focussed on developing the Medical Service at Harlem to provide exemplary continuing care. The Service consists of approximately 300 beds (including Chest Service), and is intensively used, having an occupancy of 110% of capacity. The problem of overcrowding is being energetically attacked by acceleration of diagnostic procedures, by opening up new possibilities for chronic care and follow-up, and by organization of subspecialty groups. The variety and severity of illness encountered makes the Harlem Service unusually attractive as a training area for fourth year students that more than makes up for the loss of the Bellevue Service.

In addition to the change at Bellevue, which had been decided upon late in 1966, another major shift was necessitated by the decision early in 1968 of the New York City Department of Hospitals to

convert Francis Delafield Hospital from a specialized cancer hospital to a general medical hospital with special emphasis upon cancer. The decision was taken, only after prolonged deliberation, in order to make it possible to arrange for house staff coverage by the Medical Service at Presbyterian Hospital and to improve bed utilization. To provide for the expansion of attending staff necessary to supervise an active residency training program as well as the work of fourth year clinical clerks, the Columbia University Research Service at Goldwater Memorial Hospital moved to the Delafield during the months of July and August. Dr. George L. Curran, formerly Director of the Goldwater Service, is now Chief of Service of the Combined Goldwater-Delafield staff. Second year medical residents from Presbyterian have assumed the responsibility of staffing the Delafield Service where they are working jointly with residents from St. Luke's and Roosevelt Hospitals. The census has now increased to as high as 90% without affecting the number and variety of patients admitted with cancer. This development of general community hospitals within the immediate Medical Center setting and at the Harlem Center, will give the department a remarkable opportunity to build a meaningful program in community health care for the upper Manhattan region.

Staff Changes and Honors

The department suffered the loss of a number of its outstanding members during the past year by

death, retirement or resignation. The department suffered a profound loss in the death of Dr. F. Randolph Bailey on September 20, 1968. Dr. Bailey will be long remembered for his gentle and effective presence at the bedside, for the integrity, concern and sincerity that illuminated all he did. Despite a long and distressing illness, Dr. Bailey continued to teach until retirement in July, 1968 as Clinical Professor Emeritus of Medicine and Consultant to Presbyterian Hospital. He was for many years Director of the Medical Clinics in Vanderbilt Clinic, Chairman of the Social Service Committee of the Medical Board, and a member of the Admissions Committee. We must also report with sorrow the death of Dr. Ralph H. Boots, Associate Clinical Professor (retired) and Consultant to Presbyterian Hospital, on October 21, 1968 at the age of 78. Dr. Boots founded the Falkner Arthritis Clinic at the Medical Center and the Arthritis Foundation. He received many honors for his pioneering contributions to the study of rheumatic diseases and for his dedication to the highest ideals of academic medicine.

On July 1, 1968, Dr. Arthur J. Patek retired after 31 years as a member of the Columbia Research Service at Goldwater. His contribution to the understanding of chronic disease, particularly in the field of human and experimental cirrhosis, did much to establish the reputation of the Goldwater unit. The closure of the Bellevue and Goldwater Services and the reorganization at Delafield have been associated with a number of staff changes. Dr. Alfred Gellhorn resigned in July 1968 to assume new duties as Dean of the Medical School of the University of Pennsylvania. As Chief of the Medical Service and Director of the Cancer Research Institute at the Francis Delafield Hospital, Dr. Gellhorn assembled an effective and loyal team devoted to studies of neoplastic disease. Of this group, Dr. John E. Ultmann is going to the University of Chicago School of Medicine, Dr. Frederick A. O. Klipstein, to the University of Rochester School of Medicine, and Dr. Henry O. Heinemann to Cornell University School of Medicine, as Associate Professors of Medicine. With the exception of Dr. Daniel Rudman, who resigned to take a position as Professor of Medicine and Director of the Clinical Research Center at Emory University School of Medicine, taking with him Dr. Mario De Girolamo, the Columbia Research Service at Goldwater Memorial Hospital has transferred to Delafield to fill these openings and to provide additional staff. Other losses were incurred in the move from Bellevue to Harlem. Dr. William A. Briscoe ac-

epted a position at the New York Hospital where he will be able to establish a new Respiratory Unit and most members of the Chest Service transferred with the Service to the Department of Medicine at New York University School of Medicine. Dr. John H. McClement will retain his position in the Department of Medicine and the Medical Service, however, and will continue to work closely both with the new Chest Service at Harlem Hospital and the newly organized respiratory group at the Medical Center. Dr. Henry O. Wheeler has accepted a position as Professor of Medicine at the Medical School of the University of California in San Diego and Dr. William Shaw has moved to the Department of Medicine at the University of Miami School of Medicine. Dr. Henry M. Thomas has come to the department from Johns Hopkins to join the respiratory group, while Drs. Rejane Harvey, Vincent P. Butler, Jr., John Lindenbaum, and Peter R. B. Caldwell have transferred to the Medical Center.

Dr. Andre Cournand received an honorary degree from the University of Nancy (France) and served as a Visiting Professor at the University of Rochester School of Medicine. He participated in various symposia in Italy, England, Switzerland and the United States, and joined other members of the faculty in a series of colloquia in Paris, Brussels Geneva, and London for the International Alumn Association of Columbia University. The Trudeau Medal of the National Tuberculosis and Respiratory Disease Association was awarded Dr. Dickinson W Richards at its annual meeting in Houston. The Merck Company Foundation made a gift of \$250,000 in September toward the establishment of an endowed professorship in the Department of Medicine in honor of Dr. Richards. Drs. Richard and Cournand have worked together during the year to promote the activities of the Institute for the Study of Science in Human Affairs; Dr. Richards devoting much time to the organization of lectures and visiting professorships in the History of Medicine; Dr. Cournand collaborating in the organization of a cooperative international project on computer aided instruction of hematology.

The opening of the new Dana W. Atchley Pavilion December 5th was a gala occasion, honoring Dr. Dana Atchley's years of dedicated teaching, research and devoted service to the Medical Center. Dr. Stanley E. Bradley was made Chairman of the Visiting Committee to the Medical Department at Brookhaven National Laboratory and visited the SEATO-Pakistan Cholera Research Laboratory in Dacca, East Pakistan as a member of its Human

Research Committee for discussions of work-in-progress. The University of North Carolina School of Medicine and the Queens University School of Medicine (Kingston, Ontario) invited Dr. Harry W. Fritts to serve as Visiting Professor of Medicine. Dr. Paul A. Marks was Visiting Lecturer at the Italian Atomic Energy Commission Laboratories in Rome, and at the Institute of Physical Chemistry in Paris. Dr. Marks continued his work as Editor-in-Chief of the *Journal of Clinical Investigation* with Drs. Harry W. Fritts and DeWitt S. Goodman as Associate Editors. He served on the Organizing and Program Committees for the XII International Congress of Hematology (New York). Dr. Charles A. Ragan, Jr. was made a member of the National Advisory Arthritis and Metabolic Disease Council of the National Institute of Arthritis and Metabolic Diseases.

Dr. Julia M. Jones received the Bruce Douglas Award of the Michigan Thoracic Society for her contributions in tuberculosis research. She completed her term of office as President of the New York Tuberculosis and Health Association, and as a member of the Board of Directors and Research Committee of the Stony Wold Fund. Dr. John H. Laragh served as Visiting Professor of Medicine at Ohio State University School of Medicine and at Duke University School of Medicine. He was elected Chairman of the Council for High Blood Pressure Research of the American Heart Association. Dr. Sidney C. Werner was invited to give the Jacobaeus Lecture of the Nordinsulin Fond of Sweden, presented this year in Helsinki, Finland. He lectured at the Niels Steensens Hospital in Copenhagen and was asked to be principal speaker at the Xth International Congress of Internal Medicine. The American Thyroid Association elected him to its Board of Directors. Dr. Nicholas P. Christy, Director of the Medical Service at Roosevelt Hospital, served on the Program Committee and chaired a session of the IIIrd International Congress of Endocrinology in Mexico City. Dr. Theodore B. Van Itallie, Director of Medicine at St. Luke's Hospital, is on leave-of-absence as Visiting Professor of Medicine at the American University of Beirut (Lebanon) for a 10 month tour of duty. Dr. M. Irene Ferrer was invited to give lectures at the University of Padua (Italy). Dr. Charles L. Christian was made a member of the General Medicine Study Section of the National Institutes of Health and Dr. DeWitt S. Goodman served as a member of the Metabolism Study Section. Dr. Goodman was Chairman of the 1968 Gordon Research Conference on Lipid Metabolism.

The Board of Trustees of the Roosevelt Hospital has honored Dr. Arthur J. Antenucci by its decision to give his name to the new 11-story Research Building at Roosevelt. Dr. John F. Bertles was elected to the membership of the American Society for Clinical Investigation and to the fellowship of the American College of Physicians. Drs. A. Gregory Jameson and Marianne Legato gave lectures to the Trivenetian Section of the Italian Cardiologic Society in Padua. Dr. William B. Sherman served as Honorary President of the 6th International Congress of Allergology in Montreal, as Faber Lecturer at Stanford University School of Medicine, and as Chairman of the Allergy Section of the American Medical Association. Dr. Vincent P. Butler, Jr. was elected a member of the American Association of Immunologists, Dr. Hymie L. Nossel lectured in South Africa at the University of Cape Town and the S. A. Institute for Medical Research in Johannesburg. He was elected to the American Society for Clinical Investigation and the American Society for Experimental Pathology. Dr. Richard S. Rivlin was elected to the American Thyroid Association and spoke at the International Congress of Endocrinology in Mexico City. Dr. Gustav J. Beck served as Vice President of the Eastern Chapter of the American Association for Clinical Immunology and Allergy and lectured in Santo Domingo, the Dominican Republic. Dr. Albert W. Grokoest was President of the New York Rheumatism Society. Dr. Lionel Grossbard was elected to the American Society of Hematology; Dr. Myron C. Patterson, to the fellowship of the American College of Cardiology and the American College of Angiology; and Dr. Joyce C. Shaver, to the Endocrine Society. Dr. Shaver participated in the Laurentian Hormone Conference and was made Director of the New Clinical Research Unit at Roosevelt Hospital.

Patient Care and Teaching

During 1968, 4,724 patients were admitted to the Medical Service at Presbyterian Hospital to stay for 18.1 days on the average. Of these admissions, 41 per cent presented with cardiovascular disease, 13 per cent with gastrointestinal disorders, 11 per cent with respiratory diseases, 9 per cent with metabolic and endocrinologic disturbances, 9 per cent with hematologic and neoplastic disease, and 5 per cent with arthritis and connective tissue disease. The Admitting and Emergency Clinics received 25,672 new patients in the course of a total of 44,718 visits. The Group and Medical Clinics accommodated 11,088 new patients. In order to

cope effectively with the growing load of seriously ill patients in both the Inpatient and Outpatient Services and to discharge the added responsibility of staffing the Medical Service at Delafield Hospital, the house staff has been increased during the past year and further increases have been authorized for the year ahead. The current second year residency staff has been augmented by 4 additional positions and will increase to a total of 12. This will permit assignment of six residents to Delafield and two at all times to admitting. A rearrangement of the Ward Services is planned with an organization of four Services (8 East, 9 East, 8 West, 9 West) of approximately 20 beds each, to replace the current three Services (East, West and Center). All four services will admit patients to two intensive care units situated in the present Center Services. One of these will be a Cardiac Monitoring Unit and the other a Unit for Special Care of respiratory and other acute problems. This change will require an expansion of the intern and first year resident groups from 12 to 16 each. The resultant reduction in patient load per physician will permit a more effective doctor-patient relationship and will promote a more lively student-house staff interaction. The added services will also require a larger attending assignment with improved clinical teaching as a result of the lower student-teacher ratio.

Plans are being made, in collaboration with the Nursing Service, to develop a special team organization for the cardiac monitoring and intensive care units in which student and house staff participation will assure more efficient control and an augmented opportunity for productive clinical investigation. The increase in cardiologic problems has required an increase in the number of residents in cardiology from two to four. This, together with the establishment of an advanced cardiology training program, directed by Drs. Fritts and Ferrer and supported by a grant from the National Heart Institute, has made it possible to organize an integrated three year course of graduated experience and responsibility in all aspects of the field.

The fourth year clinical clerkship in Harkness Pavilion has proved very successful and plans are being made to extend it. In Harkness, a somewhat different pattern of disease entities is encountered. Cardiovascular and gastrointestinal disease predominated during 1968, as on Ward Services, accounting respectively for 29 per cent and 21 per cent of admissions, whereas hematologic and neoplastic disorders made up 18 per cent, a large miscellaneous group of conditions accounted for 14 per cent, and the remainder fell into categories of respiratory (5

per cent), endocrinologic (4 per cent), renal, thromboembolic and connective tissue diseases (3 per cent each). Attractive and popular fourth year clerkships were also well attended at Harlem, Roosevelt and St. Luke's Hospitals.

The department was honored by visits from numerous distinguished teachers during 1968. Dr. George W. Thorn, Hersey Professor of the Theory and Practice of Physics at the Harvard Medical School and Physician-in-Chief at the Peter Bent Brigham Hospital, spent the week of February 11, 1968 on the Medical Service as Visiting Professor of Medicine and Attending Physician, Pro Tem. Many others contributed importantly in such departmental exercises as the Combined Staff Conferences and in programs sponsored by the Institute for the Study of Science in Human Affairs, including Dr. George Schreiner of Georgetown University in Washington, D. C., Dr. James G. Rankin of St. Vincent's Hospital, Victoria, Australia, Dr. Hebell Hoff, Professor of Physiology at Baylor University, Drs. D. Steinberg, R. Chanock, N. Talal, R. Henkin and S. Rosen from the National Institutes of Health, Dr. Winifred M. Watkins of the Lister Institute of Preventive Medicine in London, Dr. Grant Liddle from Vanderbilt University, Dr. P. Kunkel from Rockefeller University, Dr. M. Campbell from McMasters University in Canada, Dr. Antonio Paes de Carvalho from Brazil, Dr. Frantisek Lenoch from Czechoslovakia and Dr. David G. Palmer from the Wellcome Research Institute, New Zealand. Of special interest to the department were a colloquium on the use of the computer in medicine at Greystone House and a series of lectures on medical history, both under the auspices of the Institute.

Research

Studies of pulmonary function and disease have been made in a number of departmental units, including the Cardiorespiratory Laboratory at the Medical Center under the direction of Dr. Harry W. Fritts, Jr., the Cardiopulmonary Laboratory (formerly at Bellevue and now at Harlem Hospital) under the direction of Dr. Rejane M. Harvey, the Cardiopulmonary Laboratory at St. Luke's Hospital under Dr. A. Loomis Bell, and a number of other units. Dr. Fritts is working with Drs. Henry Heinemann, Peter Caldwell and Ronald Wigle on the phospholipid content of normal and granulomatous canine lung. They have also evaluated a reduction during hypoxia in radioactive palmitate incorporation in the lipid pool of both normal and diseased lungs. Drs. Thomas, Cottrell, Caldwell and Fritts

are engaged in a study of the response of the bronchial circulation to granulomatous pulmonary disease in the dog. In vivo measurements of the alveolar arterial oxygen difference during the course of development of the disease in the lung are being made in the unanesthetized dog by Drs. Caldwell, Fritts and Wigle. Pathologic studies of the diseased lung in dogs are being carried out by Drs. Caldwell, Fritts and Cottrell, including routine histology, electron microscopic sections and injectate studies of the bronchial and pulmonary arterial systems to evaluate the vascular supply to the diseased portions. A study of the cardiovascular reflexes in the upper airway which mediate the effect of inhaled cold air in the dog, has been inaugurated by Drs. Caldwell, Fritt and Joseph Schwartz. Dr. Alvan L. Barach has been successful in developing apparatus to remove pollutants from room atmosphere and to deflate the lungs of patients with chronic obstructive pulmonary disease. At Delafield Hospital, Drs. Hylan A. Bickerman, Edith B. Reilly, and John M. Rodgers have used the body plethysmograph and helium dilution techniques to measure the reduction in entrapped gas and airway resistance in patients with chronic obstructive pulmonary disease following inhalation of a bronchodilator aerosol. Similar studies are under way at St. Luke's Hospital where Drs. C. Redington Barrett, Norma Braun, and A. L. Loomis Bell are examining the effects of aerosol bronchodilators and of graded oxygen breathing on right and left cardiodynamics in patients with chronic pulmonary diseases, and Drs. Michael H. Grieco and Richard Pierson, Jr., have found aerosol methacholine induces a greater bronchoconstrictor and hypoemic effect in asthmatic patients than in normals. Dr. Veljko Krstulovic and Dr. Lucy Swift, with the assistance of Mr. William Rosenberg, have shown a reduced carbon monoxide diffusing capacity per unit of lung volume in asthmatic children. At Harlem Hospital, Dr. Dudley F. Rochester is using the clearance of radioactive xenon following intramuscular injection as a measure in blood flow through the diaphragm of anesthetized dogs and examining the effect of hyperventilation on increased airway resistance. He has also worked with Dr. Roberta M. Goldring (Medicine — New York University) in making measurements of diaphragmatic electrical activity via esophageal electrodes in normal and obese human subjects and in patients with chronic obstructive bronchopulmonary disease to show that the ventilatory response to carbon dioxide inhalation is modified both by changes in respiratory center responsiveness and in mechanical factors.

Dr. Harvey and her associates have been interested chiefly in the pulmonary circulation. In collaboration with Drs. Yale Enson, Donald H. Schmidt, Margaret Kilcoyne, Khairoon M. Ally, and Thomas Q. Morris, she is using an animal model of Asiatic cholera to test the hypothesis that severe acidosis produces a redistribution of the circulating blood volume from the peripheral to the central circulation by causing peripheral vasoconstriction and a consequent reduction in the capacity of the venous reservoirs. A new technique, employing two indicators, has been introduced by this group to permit measurement of the central blood volume (right atrium to aortic valve) and its components (right heart, pulmonary and left heart blood volumes). Drs. Yale Enson and Harvey have undertaken a statistical evaluation of the determinants of pulmonary arterial pressure in normal subjects and in patients with representative forms of acquired heart disease, to identify criteria by which vaso-motor responses in the pulmonary bed may be assessed. Dr. Milena L. Lewis and Clarita Herrera have been working on a method for measuring pulmonary artery blood volume, using the mean transit time of macroaggregated ^{131}I human albumin between the right ventricle and the pulmonary capillaries, when the protein particles are stopped. Dr. Gerard Turino, in collaboration with Dr. Samuel Shubrooks, Albert Waldo and John O. Burris, in the Cardiovascular Diagnostic Laboratory at Presbyterian Hospital, is studying factors which control fluid exchange and extravascular volume measured by a double indicator dilution technique, in the lungs in patients with congenital and acquired heart disease at rest, during exercise, and following mobilization of body water by acute diuresis or changes in pulmonary hemodynamics. Dr. A. Gregory Jameson has continued studies at Roosevelt Hospital on the instantaneous velocity of aortic flow as an index of cardiac work and on pulmonary arterial vasomotion. With Drs. Waldo, Shubrooks and Welton M. Gersony, Dr. Turino has begun work on measurements of the quantitative distribution of blood flow and ventilation of the lungs in congenital and acquired heart disease and in experimental hemorrhagic shock in dogs using radioactive isotopes and rapid response counting and imaging.

The Cardiac Monitoring Unit has continued to serve as a setting for collaborative investigation by members of the Department of Medicine and Pharmacology. Dr. J. Thomas Bigger, Jr. has completed a study in association with Drs. Harold C. Strauss, Arthur L. Bassett and Brian F. Hoffman (from Pharmacology) on the effects of diphenylhy-

dantion (DPH) on the sinoatrial node, specialized atrial fibers and ordinary atrial muscle fibers. He has also made a study of the effect of DPH in the intact dog with Drs. Hoffman and Paul F. Cranefield (Pharmacology), Drs. Anthony T. Kovalik and Paul D. Harris (Surgery) and Mr. D. I. Weinberg (International Business Machines Corporation). Studies in progress in the laboratory include an investigation, in collaboration with Dr. Strauss, of the effects of DPH on atrioventricular conduction in intact dogs and isolated perfused rabbit heart preparations and also with Dr. Strauss, of MJ 1999, a β -adrenergic blocking agent, on the electrophysiological properties of canine Purkinje fibers and canine ventricular muscle cells. Dr. Robert H. Heissenbuttel and Dr. Bigger were able to show that a graded increase in QRS duration could be produced in man in proportion to plasma quinidine concentrations even at low levels. Dr. Bruce N. Goldreyer and Dr. Bigger have succeeded in elucidating the mechanism initiating an atrioventricular reentrant tachycardia in a patient with an otherwise normal heart and without Wolff-Parkinson-White syndrome, using an original technique of recording the His bundle electrocardiogram in intact man with a special electrode catheter. They are also continuing an analysis of factors affecting ventriculoatrial conduction, comparison of the atrioventricular refractoriness during atrioventricular conduction and during ventriculo-atrial conduction. Dr. Bigger has initiated an effort with Dr. Raymond Bonner (IBM) to develop computer programs for on-line, real time analysis of cardiac arrhythmias in intensive care areas.

Studies of myocardial function at the cellular level have occupied a number of the staff. Dr. Vincent P. Butler, Jr. has succeeded in developing methods for producing digoxin specific antibodies which he and the late Dr. John F. Watson (University of Buffalo School of Medicine) have proved to be capable of removing digoxin from cells and in doing so to reverse the glycoside effect upon potassium transport. With Dr. Donald B. Schmidt, Dr. Butler has proved that this unique effect may have therapeutic significance by demonstrating that rabbits immunized against digoxin are protected against lethal doses of the drug. An attempt is now being made to determine if established digitalis toxicity in the dog can be reversed by passive transfer of antibodies. At St. Luke's Hospital, Drs. Robert B. Case, Richard S. Crampton and Miehel Nasser, in collaboration with Dr. Colin McCord (Surgery), have investigated myocardial lactate metabolism and potassium exchange during valvular

replacement surgery. A continuous automated sampling technique was used which had been developed earlier in the year. Drs. Case, Nasser and McCord also investigated the metabolism of the heart which had been anoxic for one hour and the metabolism of this heart following restoration of sinus rhythm. Drs. Marianne J. Legato, Marcia B. Bull and M. Irene Ferrer are collaborating in a study of ultra-microscopic changes of disease in myocardium obtained at open heart surgery.

Dr. John Laragh and his group, including Dr. Michael A. Newton, (St. Mary's Hospital in London), Dr. Frank J. Goodwin, (the London Hospital), and Dr. Inge Oppenhoff (University of Cologne) have continued their studies of aldosterone, angiotensin and the hormonal control of sodium and potassium metabolism in patients with hypertension or congestive heart failure. Dr. Lawrence Krakoff, Dr. Leslie Baer and Dr. Manuel Torres Zamora, have recently joined the group. Drs. Jay I. Meltzer, Marcia Bull, John Postley, and David J. Gocke have been part-time participants. Studies characterizing the patterns of aldosterone secretion and plasma renin in various forms of hypertensive disease have continued. A new entity has been described in hypertensive patients with secondary aldosteronism, hypokalemia and reduced plasma renin. Dr. Abbie Knowlton, in collaboration with Drs. Frank Goodwin and John Laragh, has explored the effect of desoxycorticosterone acetate and of renal artery constriction upon the blood renin response of rats to low and high sodium intakes; and, in collaboration with Dr. Postley, has determined that renal artery constriction, severe enough to induce brisk hypertension, does not interfere with the capacity of the clipped kidney to undergo hypertrophy in response to contralateral nephrectomy. In studies with Dr. Laragh, Dr. Gocke has developed a highly sensitive and specific radioimmunoassay which has made it possible to measure angiotensin II directly for the first time, in a variety of physiologic and pathologic conditions and to provide confirmation of the classic concepts of the interaction of the reninangiotensin system.

Dr. Paul Cannon has been studying the nutrient blood flow in myocardium and kidneys utilizing radioactive inert gases. In association with Dr. Jacob I. Haft and Dr. Philip M. Johnson (Radiology), a method was developed to localize experimental myocardial infarctions in vivo with Xenon 133 and scintillation photography. Studies of the intrarenal distribution of nutrient blood flow in response to experimental procedures which alter renal tubular sodium reabsorption have been undertaken.

with Drs. Margaret M. Kilcoyne and Paul Nonkin, that indicate that altered intrarenal blood flow accompanies aortic constriction and partial thoracic caval occlusion. With Drs. David S. Svahn and Felix E. Demartini, a study of normotensive and hypertensive patients has proved that fractional tubular reabsorption of many ionic species (Na, K, Cl, Ca, Mg and urate) is depressed in response to the extracellular fluid volume expansion and renal vasodilation induced by hypertonic saline infusions.

Drs. Bradley and Jaime Coelho have adduced evidence that isotonic saline loading in the dog inhibits tubular reabsorption of sodium even during profound hemorrhagic shock, indicating "third factor" activity in the face of diminished blood volume. With Drs. Morris, Joseph Sweeting, and Richard Mason (Physiology) they have continued to examine the renal functional responses to unilateral nephrectomy in the dog. Dr. Kuang-Chang Chien is measuring the dimensions of nephrons from hypertrophic canine kidneys to determine if the hypertrophic stimulus affects all segments of the nephrons uniformly. Drs. Coelho, Chien, and Sergio Stella are investigating the distribution of functional capacity within the nephron population of the rat employing microdissection to isolate a sample of nephrons within each of which filtration rate during a prior set period may be determined in terms of filtered potassium ferrocyanide precipitable as Prussian Blue. Changes in the distribution of glomerular activity thus evaluated will be examined during hemorrhagic shock, uremia and other situations in which nephron heterogeneity may be exaggerated. Dr. Richard D. Baerg, working with Dr. Daniel V. Kimberg, has developed a technique for the surgical production of a chronic uremic state in the rat. Studies now in progress are aimed at using this preparation to define the mechanism of the resistance to vitamin D associated with uremia.

Dr. Curran and the group formerly at Goldwater Memorial Hospital are carrying on their investigations of lipid biochemistry and metabolism at the Francis Delefield Hospital. In cholesterol biosynthesis, Dr. Robert Burch and Dr. Curran are studying the effects of p-chlorophenoxyisobutyrate (Atromid) on acetoacetyl-CoA deacylase activity. Drs. Daniel Rudman and Suat Akgun have separated human α -lipoprotein by chromatography into two non-identical peptide units of similar molecular weight but differing amino acid sequence and immunologic reactivity. Dr. Mario DiGirolamo has demonstrated significant variations in the size and number of fat cells in different locations of the adipose organ of the young rat; a greater hetero-

geneity in the cell size in younger as compared to older rats; and a remarkable variation in the hyperplasia/hypertrophy ratio in experimentally overfed animals of one species as compared to another. Studies of the effect of the pattern of carbohydrate nutrition upon serum lipid levels in patients requiring tube feeding have been continued by Dr. Forrest E. Kendall. Dr. Liese L. Abell has found that a 17 α -methyl-5- α -androstane-3 β , 17 β -diol is the most abundant metabolite of the hypocholesteremic steroid, 17 α -methyltestosterone in dogs. Dr. Terrence T. Kuske has isolated and characterized the sugar and fatty acid composition of the atypical glycolipids of human (Gaucher's) spleen.

A research program in the field of lipid metabolism has been continued in the laboratory of Dr. DeWitt S. Goodman at the Medical Center. Most of the work of this group has dealt with the metabolism of vitamin A, and of cholesterol, both in experimental animals and in man. In collaboration with Drs. Noel H. Fidge, Amiram Raz, Frank Smith, and Mr. Tatsushi Shiratori, studies of the transport of vitamin A in human plasma by the plasma protein (retinol binding protein) recently discovered in the laboratory, have been made by Dr. Goodman. Studies have been started to examine the turnover of retinol binding protein in normal subjects and in patients with various diseases. Research has been continued in collaboration with Dr. Robert P. Noble on the turnover of plasma cholesterol in man, and on the effects of certain lipid-lowering drugs on cholesterol metabolism in man. An electron microscopic study has been carried out, in collaboration with Drs. O. and Y. Stein of the Hadassah Medical School in Jerusalem, which has defined the ultrastructural events occurring during the metabolism of newly-absorbed chylomicron cholesterol in rat liver.

In the Nutrition and Metabolism Unit at St. Luke's Hospital, Dr. Theodore B. Van Itallie with Drs. Sami A. Hashim, Francis X. Pi-Sunyer, and Robert G. Campbell have continued an investigation of absorption, transport, and metabolism of even and odd numbered medium chain fatty acids in man and animals. Drs. Campbell and Hashim have examined metabolic consequences of enriching adipose tissue of dogs with significant amounts of odd chain fatty acids. In addition, they are following food intake behavior of sedentary and active obese and normal subjects, using a monitored-food-dispensing apparatus. Dr. Pi-Sunyer has studied the effect of an oral contraceptive agent on insulin secretion and serum lipids. With Drs. Michael Grieco

and Richard Pierson, he studied the circulatory and metabolic responses of normal and asthmatic subjects to α and β adrenergic stimulation. Dr. Pi-Sunyer is continuing studies with Drs. Campbell and Hashim on the effect of ketone bodies and fatty acids on insulin secretion. At Roosevelt Hospital, Dr. Gerald B. Phillips is using new methods he has developed for detailed analysis of fatty acids and phospholipids to determine the lipid composition of the plasma and the red cells in patients with various disorders.

Drs. Charles A. Ragan and Anne M. Briscoe have extended their investigation of amino acid metabolism in rheumatoid arthritis. They are also evaluating urinary and salivary secretion of salicylate. Drs. Paul Phillips, Charles L. Christian and Paul Ellner (Microbiology) are engaged in efforts to isolate and characterize microbial agents in chronic rheumatic disease. A prospective study of the natural history of systemic lupus erythematosus is being made by Dr. Dorothy Estes in the Edward Daniels Faulkner Arthritis Clinic. Drs. Robert W. Lightfoot, Jr. and Ronald E. Drusin, working in Dr. Christian's laboratory, are investigating the biological properties of immune complexes of different varieties as an approach to better understanding of immunologically induced chronic glomerulonephritis. Dr. Lawrence J. Kagen has embarked upon a quantitative evaluation of myoglobin synthesis in muscle tissue homogenates and subcellular systems. An analysis of the antigenic determinants of human collagen by Dr. E. Carwile LeRoy has been advanced by the use of a collagenase that has been isolated from the joint tissue of patients with rheumatoid arthritis with the cooperation of Dr. Edward Harris (Massachusetts General Hospital) and that selectively cleaves the intact tropocollagen molecule. Antibodies to human skin collagen have been characterized by Dr. LeRoy and will be used to study the products of human skin fibroblasts in tissue culture, in collaboration with Dr. Phillips. Skin blood flow measurements, using $^{131}\text{Xenon}$ are being made in collaboration with Drs. Paul Cannon and John Downey (Rehabilitation Medicine).

Dr. William B. Sherman has continued at Roosevelt Hospital an investigation in collaboration with Dr. John T. Connell on the therapeutic usefulness of pollen antigens in the management of patients with hay fever. The phenomenon of blast transformation of lymphocytes from patients with ragweed hypersensitivity on exposure to ragweed antigen E *in vitro* is being used by Drs. Elliott Middleton, Jr., John Hadden, and Ira Finegold as an ap-

proach to an evaluation of reaginic antibody formation. With Dr. Stanley R. Finke, Dr. Middleton is using a guinea pig tracheal chain smooth muscle preparation to test the possibility of beta-adrenergic blockade in the pathogenesis of bronchial asthma with special attention to the restorative effect of hydrocortisone. Dr. Michael H. Grieco at St. Luke's Hospital is attempting to classify the rhinitides by histologic study of nasal biopsy specimens from patients with allergic and non-allergic rhinitis.

The problems of infectious disease have played a more prominent role in the life of the Medical Service during the past year. Viral infections were particularly important since the influenza epidemic affected most of the attending and house staff while it accounted for a large proportion of admissions and deaths during December. Admissions of patients with tuberculosis also appears to be on the rise, from 22 in 1967 to 49 in 1968. Dr. Julia M. Jones has completed a long-term appraisal of tuberculosis among student nurses at Bellevue which was begun in 1930 in collaboration with Dr. J. Burns Amberson. The Isolation Unit (7 East) has continued to be extremely useful, maintaining a 77 per cent occupancy of which 75 per cent was infectious disease. Dr. Harold C. Neu has taken Dr. Yale Kneeland's place as Chairman of the Hospital's Committee on Communicable Diseases and Antibiotics. He has continued his studies of bacterial surface enzymes: purifying the 5'-nucleotidases and cyclic phosphodiesterases of all the Enterobacteriaceae; completing, with Dr. Ian Nisenson (Urology) an electron microscopic and histochemical localization of membrane-bound enzymes of *E. coli*; and finding, with Dr. Robert E. Canfield, little evidence of therapeutic usefulness for human lysozyme. Dr. Canfield has almost completed an analysis of the chemical structure of human lysozyme. Drs. Neu and Herbert Swartz are making a study of the bacteriological and clinical effects of carbenicillin. At the Mary Imogene Bassett Hospital, Dr. Malcolm I. Page has found that *Neisseria meningitidis* may grow either as an L-form or as a classic bacterium depending upon the media employed. Dr. David J. Gocke has continued *in vitro* studies of cellular immunity. He has collaborated with Dr. Thomas Q. Morris in on-going attempts to modify the course of canine viral hepatitis (CVH) in susceptible puppies by administration of hyperimmune serum at various times following induction of infection.

Investigation of hepatobiliary functions has been carried forward in several directions in Dr. Bradley's laboratory during the past year. Drs. Morris

and Veronika Macarol (University of Belgrade) have used the rate constant for Bromsulfalein disappearance as a guide to the deterioration of liver function during the course of CVH. They have also pursued an inquiry into the hepatic handling of bile salt, using labelled taurocholate, by normal and diseased dogs. Mrs. Katherine J. Baker has collaborated with Drs. Morris and Macarol in a re-appraisal of biliary proteins. Drs. Henry O. Wheeler and Robert T. Whitlock completed an investigation of apparent hydrogen ion transport by the isolated rabbit gall bladder *in vitro*. Dr. Joseph G. Sweeting has carried forward his studies of pancreatic function in the dog. Drs. Arthur Patek, Forrest Kendall and Robert L. Hirsch have continued their studies at Goldwater Memorial Hospital of the effect of various dietary fats in experimental cirrhosis in the rat. Drs. Esteban Mezey and Peter R. Holt, at St. Luke's Hospital, showed that measurement of serum alcohol dehydrogenase will greatly help to distinguish intrahepatic from extrahepatic obstructive jaundice.

With Dr. Charles Lieber (Cornell), Dr. John Lindenbaum has found that alcohol plus adequate protein and vitamin intake in human volunteers induces a dose-related vacuolization of bone marrow precursor cells, thrombocytopenia and changes in iron metabolism. Dr. Lindenbaum has found that Peace Corps Volunteers with bowel damage acquired during residence in the tropics rapidly recovered normal absorptive function and mucosal appearance after return to New York. Drs. Kimberg and Baerg have been studying the mechanisms involved in the cortisone-related inhibition of the active transport of calcium at the mucosal surface as well as across the intestine in isolated preparations obtained from the rat. In the Gastrointestinal Unit at St. Luke's Hospital, Drs. Holt and Susanne B. Clark demonstrated competitive inhibition of the intestinal absorption of long chain triglycerides by medium chain triglycerides. Drs. Holt and Clark have also described in the rat a gastric lipase for medium chain triglycerides which is activated following fat feeding.

Dr. Charles A. Flood has been investigating the secretion of gastric mucus and the effect of carbenoxolone upon it with Dr. Harold Barker (Surgery), Dr. Zacharias Dische, and Mrs. Nina Smirnow (Biochemistry). With Dr. Edmund N. Goodman, Mr. Ben T. Sandler and Mrs. Miriam R. Sullivan, he has evaluated the electrical potential in the esophagus in achalasia. A study of the prognostic value of serial proctoscopy in ulcerative colitis including the effect of various drugs on the remission

rate in the disease, has been completed in association with Dr. Sweeting. Dr. Henry Colcher has devised a new technique to permit the passage of several instruments for gastric biopsy and cytology through a plastic tube which protects the esophagus. At the Mary Imogene Bassett Hospital, Dr. John S. Davis has been working on problems of esophageal motility and pressure with particular reference to the question of sphincter competence in hiatal hernia.

Dr. Nicholas P. Christy, at Roosevelt Hospital, in collaboration with Dr. Harvey Benovitz continued his investigations of an unusual corticotrophin in the plasma of patients with Cushing's syndrome not associated with adrenal tumor. With Drs. LeClair Bissell and Alfonso H. Janoski, he completed a survey of diagnostic methods in Cushing's syndrome. With Dr. Joyce C. Shaver, he continued his attempts to define the abnormal estrogen metabolism in patients with cirrhosis of the liver. Drs. William Rosner, Susan M. Deakins and Christy made further studies of the properties of the serum globulins involved in the binding of androgen and estrogen in human blood. Drs. James G. Hilton and Paul Cushman, Jr., studied the effect of chronic methadone administration of hypothalamic-pituitary-adrenal parameters in a group of 16 heroin addicts. Dr. Andrew G. Frantz, in collaboration with Dr. Donald A. Holub, has begun studies of daily secretory rates of human growth hormone by means of a newly developed catheter permitting continuous withdrawal of blood for 24-hour periods. Drs. Earl Zimmerman and Alan Robinson in Dr. Frantz' laboratory have begun work on a radioimmunoassay for vasopressin. Dr. Paul Killian has continued his investigations of insulin secretion by radioimmunoassay methods. Dr. Frantz and Dr. David Kleinberg are studying the hormonal factors affecting breast development by tissue culture methods. In studies of human chorionic gonadotropin, Dr. Robert E. Canfield has collaborated with Dr. Jennifer Bell in demonstrating that there is intrinsic heterogeneity in the carbohydrate portion that now makes it possible to define the amino acid composition of the hormone.

Dr. Sidney C. Werner has pursued studies of the circulating thyroid hormones, and of long-acting thyroid stimulator of Graves' disease. With Dr. Ildiko Radichevich, he has demonstrated that the determination of two hormones, namely, thyroxine and triiodothyronine, is possible in a single extract of serum by the Morphy-Patee principle. Investigations of the binding properties of LATS in respect to the thyroid cell have been continued with Dr. Sunder Bora of King George's Medical College,

Lucknow, India and Dr. Konrad Hsu (Microbiology). With Dr. Bora, also, further study was made of the serum albumin fraction from which iodo-tyrosines in normal plasma can be extracted. This study is continuing, as is an investigation of the effect of immunosuppressive agents in patients with Graves' disease. Thyroid cancer production has been attempted in mice given low iodine diet and small doses of 131-I.

Dr. Richard S. Rivlin at Delafield has concentrated on the problems of regulation of cellular metabolism by thyroid hormone in experimental animals and man.

Drs. Donald F. Tapley and John Buchanan have completed studies of an active transport mechanism for leucine, isoleucine and valine in isolated rat liver mitochondria. Present work includes investigations of both the nature of the stimulatory effect of thyroid hormones upon mitochondrial protein synthesis *in vitro* and *in vivo* and the nature of the energy requirements for mitochondrial protein synthesis. With Drs. Tapley and Buchanan, Dr. Marshall Primack is carrying out parallel studies with mitochondrial fragments. Together with Dr. Lawrence Kagan, Dr. Buchanan is examining the formation in rabbits of antibodies to rat liver mitochondria, mitochondrial structural protein, and certain mitochondrial enzymes. Dr. John N. Loeb has been engaged in studies of amino acid incorporation by isolated rat liver mitochondria in the presence of cycloheximide. He has also been continuing studies on the effects of hormones on ribosome turnover and studies on the intracellular localization of albumin-synthesizing polyribosomes. Dr. Kimberg's laboratory has continued studies dealing with the effects of cortisone administration on mitochondrial ion transport and on mitochondrial structure and function. In collaboration with Drs. Joseph Weiner, Alden Loud and David Spiro (Pathology), Dr. Kimberg has carried out a quantitative electron microscopic analysis of the hepatic parenchymal cells in normal and cortisone-treated rats. Dr. Richard Rivlin has shown that rat hepatic mitochondrial α -glycrocrophosphate dehydrogenase activity is reduced in riboflavin deficient rats and its induction by thyroid hormone is markedly depressed. He has also studied other enzymes concerned with FAD synthesis in riboflavin deficient and hypothyroid rats. In clinical hyperthyroidism, Dr. Rivlin has found an increased concentration of glutamic acid in the plasma. Dr. Paul Cushman, Jr., at St. Luke's Hospital, has found that hyperthyroidism is associated with more rapid turnover rates for hydrocor-

tisone whereas hypothyroidism presents with delayed turnover and delayed production of substance S.

Dr. Arthur R. Wertheim has found that production of alloxan diabetes in chromium deficient rats shows no differences in severity of diabetes as compared to controls but there is a suggestion of earlier development of gross cataracts in the chromium deficient animals. Dr. Robert E. Burch has demonstrated that rat liver mitochondrial acetoacetyl-Coenzyme A deacylase activity is enhanced with fasting and is unchanged in alloxan diabetes. Dr. Burch has also shown that the acetoacetyl-CoA deacylase found in the supernatant of rat liver homogenates is not the same enzyme found in the mitochondria. Drs. Henry Lax and Arthur W. Feinberg have published the results of a nine year study showing digital vascular abnormalities in diabetic children. In a computer-assisted, retrospective study of patients with diabetes mellitus, Dr. Hans W. Neuberg has discovered that the most important factors affecting the incidence and severity of vascular complications are age of onset, "control" of disease, the composition of the diet, and obesity.

Drs. Paul A. Marks, Richard A. Rifkind, Arthur Bank and their associates in the Laboratory of Developmental Cell Biology have continued studies concerned with erythroid cell differentiation and protein synthesis. New light has been shed on the pathogenesis of the severe hemolytic anemia which characterizes the thalassemia syndromes in studies by Drs. Bank, Albert S. Braverman, Joseph Fuhr, Clayton Nata and Marks, and Joyce V. O'Donnell. Synthesis of globin chains in developing fetal mouse is being studied by Drs. Antonio Fantoni, Albert de la Chapelle, Rifkind and Marks. The factors regulating erythroid cell development in fetal mouse have been studied by a multi-discipline approach including biochemical, morphological and tissue culture techniques with Drs. Meir Djaldeti, David Chui and Masaaki Tcrado and Julia Jones, Robin George and Leland Dobbs (medical student), with Drs. Rifkind and Marks. Drs. Bank, Fantoni, Gio vani Vulpis and Marks are studying the primary structure of the globin chains of fetal and adult mouse hemoglobins. With Dr. Allan Fried, studies on the nature of RNA directing hemoglobin synthesis were pursued. Dr. John L. Bertles continues work at St. Luke's Hospital on the general problem of sickle-cell anemia, with particular attention to the significance of relative proportions of multiple hemoglobins in this disease. The identity and behavior of mammalian erythroid "stem" cell are under study with Dr. Albert S. Gordon (Neu-

York University), and an investigation of control of hemoglobin synthesis in duck erythroid cells is proceeding with Dr. Geoffrey L. Zubay.

Dr. Hymie L. Nossel is continuing studies of the influence of surface contact on blood coagulation. He is also studying the collagen of human skin and aorta in collaboration with Dr. George D. Wilner (Pathology) and Dr. LeRoy. In collaboration with Dr. Niemetz, activated anti-hemophilic factor was found in the blood of leukemic patients preceding or coinciding with defibrillation. With Dr. J. de Kiewiet, a patient with congenital deficiency of fibrin-stabilizing-factor and antibody to the factor was diagnosed and studied. Studies are being pursued in collaboration with Dr. L. Lorand of Northwestern University.

Dr. I. Bernard Weinstein, with Drs. Robert De Bellis, Louis Fink, Tamotsu Goto, Manjul K. Agarwal, Karl Lanks and Susumu Nishimura (from Tokyo), has continued a number of investigations at Delafield. They have studied the effects of hepatic carcinogens on transfer RNA.

Drs. Rudman and Akgun have demonstrated that a mild degree of proteinuria in terminal patients with disseminated neoplastic disease frequently represents excretion of proteins in the molecular weight range of 12-50,000 rather than normal plasma proteins. Dr. Richard Ames of Roosevelt Hospital and Dr. Robert Rubin of Montefiore Hospital have described virus particles in a methylcholanthrene-induced murine ependymoblastoma. They are presently attempting to ascertain the biological activity of the virus. In addition, Dr. Ames has established human leukemic leukocytes in long-term culture and is studying their growth characteristics and fine structure. A clinical evaluation of cytotoxic agents including vinblastine and procarbazine in Hodgkins Disease has been continued by Dr. George Hyman with Drs. John Ultmann, Frederick A. Flatow, Daniel D. Nixon and Franco Muggia. Dr. F. David Kitchin with Drs. Robert M. Ellsworth (Ophthalmology) and Nina Popoff (Anatomy) has carried out electromicroscopic and statistical studies of the pattern of inheritance in the various phenotypes of retinoblastoma with additional investigation of immunological aspects of the tumors.

Acknowledgments

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We also acknowledge with deep appreciation the generosity of many other donors whose names are too numerous to enumerate in this necessarily brief report. All these gifts are of inestimable value to the Department of Medicine.

Microbiology

HARRY M. ROSE

Borne Professor and Chairman of the Department

Attending Microbiologist and Associate Attending Physician

The department was saddened by the sudden and untimely death of Dr. Albert V. Ketler (Ophthalmology) on September 10, 1968. Dr. Ketler was well known for his work on viruses that affect the eye and the respiratory tract, and was highly regarded as a teacher. His colleagues deeply regret this loss to themselves and to the Medical Center.

Dr. Deborah Locatcher-Khorazo retired after many years of distinguished service in the department and at the Eye Institute, where she directed the laboratory for diagnostic bacteriology.

Dr. Gabriel C. Godman was promoted to Professor. Dr. Henry J. Vogel was appointed Professor (Pathology) and Dr. John L. Swanson joined the staff as Assistant Professor. Dr. Josephine A. Morello, on completion of her traineeship in diagnostic microbiology, was appointed Assistant Professor and was placed in charge of the laboratory for diagnostic microbiology at Harlem Hospital. The following persons were appointed Research Associate: Drs. Satish C. Agarwal, Joe E. Coward, Frances C. Fildes (Surgery), Michael D. Katz, Helen S. Rappaport, and Giuseppe Vicari.

Dr. Giuseppe A. Andrcs, University of Rome, was appointed Visiting Professor.

Dr. Gerald S. Marx resigned as Research Associate. Dr. Uriel Bachrach, on leave from the Hebrew University of Jerusalem, Israel, where he is Associate Professor of Microbiology, resigned as Research Associate in order to complete his sab-

batical leave at the National Heart Institute. Dr. Marianne M. Dorner, Research Associate, departed to accept a position at the Ludwig's Universität, Heidelberg, Germany. Dr. Kenneth O. Lloyd, Research Associate, resigned and was appointed Assistant Professor of Biochemistry (Dermatology).

New Postdoctoral Fellows and Trainees included Dr. Byron E. Anderson, Dr. Edward D. O'Donnell and Dr. William G. Merz (Dermatology). In addition, the appointments of the following Fellows and Trainees were renewed: Drs. Marilynn Etzler, Kanematsu Miyamoto and Azra Shahidi. Postdoctoral Fellows and Trainees whose appointments ended in 1968 were: Drs. Jonathan B. Bramwell, Josephine A. Morello and Helen S. Rappaport.

The following candidates were sponsored by the department for the M.Sc.D. degree: Drs. Myles M. Behrens, Mahlon V. Freeman, Ian Nisonson and Albert T. York, Jr.

Fifteen graduate students were in residence, of whom the following completed all requirements and were awarded the Ph.D. degree: Drs. Anthony J. Garro and Sheila J. Jacobs.

Dr. Rose continued his studies at Fort Dix on the etiology and epidemiology of viral infections of the respiratory tract in military recruits. He also continued studies of virus-host cell relationships in collaboration with Drs. Calderon Howe, Konrad C. Hsu, Councilman Morgan and Herbert S. Rosenkranz. Dr. Rose participated in a Working Confer-

ence on Smallpox, which was held in Honolulu under the sponsorship of the Japan-United States Cooperative Medical Science Program, and spoke at a seminar on virus diseases, Columbia, South Carolina. He was appointed Editor-in-Chief, *Journal of Immunology*, and Chairman of the Public Affairs Committee, Federation of American Societies for Experimental Biology.

The immunochemical laboratories under Dr. Elvin A. Kabat are operated jointly under the Departments of Microbiology and Neurology. During the past year, studies on the purification and properties of antibodies to polysaccharide antigens formed in humans were actively pursued. In collaboration with Dr. William J. Yount and Professor Henry G. Kunkel, The Rockefeller University, Drs. Dorner and Kabat studied the antigenic determinants of the light and heavy chains of these purified antibodies. Drs. Dorner and Kabat also studied the reaction of iron-dextran with human antidextran and with the agglutinin of the jack bean, concanavalin A. A major continuing line of investigation was the purification and characterization of human antibodies to blood group A substances and of the animal and plant hemagglutinins (lectins) specific for A erythrocytes. Together with Dr. Kabat, Dr. Carlos Moreno studied human anti-A, Dr. Sten G. Hammarstrom investigated a hemagglutinin from the albumin gland of the snail *Helix pomatia*, and Dr. Etzler examined the anti-A lectin *Sophora japonica*. Drs. Lloyd, Eduardo Licerio and Kabat studied a series of oligosaccharides isolated by alkaline degradation with NaOD-NaBD₄ from an Le^a substance occurring in ovarian cyst fluid. A study of the optical rotatory dispersion and circular dichroism curves of the Le^a oligosaccharides was carried out by Drs. Sherman Beychok (Biological Sciences), Lloyd and Kabat. Drs. Vicari and Kabat studied materials obtained from ovarian cyst fluid which lacks blood group A, B, H, Le^a and Le^b determinants. Drs. Flavio Gruezo and Kabat isolated and characterized additional oligosaccharides from blood group substances. Drs. Sigfrid Svensson, Institute of Organic Chemistry, University of Stockholm, and Dr. Byron E. Anderson, Department of Biology, Johns Hopkins University, joined the laboratory and will be working on blood group structure. A book by Dr. Kabat, *Structural Concepts in Immunology and Immunochemistry*, was published in March, 1968. Dr. Kabat taught at two summer courses sponsored by NATO, one at Val Morin, Canada, and the other at Grignon, France. He delivered four of the E. B. Wilson lectures at the University of Texas at Austin, was Claude Bernard Lecturer

at the University of Montreal, where he received the Claude Bernard Medal, and attended a World Health Organization Expert Committee Meeting in Geneva on the WHO Research and Training Program, which is setting up centers in Ibadan, Sao Paulo and Singapore.

Dr. Howe continued his studies of the interaction of myxoviruses with plasma membranes, which involved the purification of cell receptor components as well as of viral antigens, and the correlation of immunochemical with electron microscopic observations. The latter part of the work was carried out in collaboration with Dr. Morgan. A study of the relation of virus receptor substance to other human erythrocyte membrane constituents was completed. The host antigen of influenza virus was analyzed in quantitative precipitin reactions in order to gain insight into the antigenic determinants of this sulfated mucopolysaccharide; these latter studies were conducted in collaboration with Dr. Karl Meyer, Yeshiva University, and Dr. Arild Harboe, National Institute of Health, Oslo, Norway. Dr. Howe served as a member of the Virology and Rickettsiology Study Section, National Institutes of Health, and was an invited speaker at the annual meeting of the Infectious Diseases Society of America.

Dr. Morgan, in association with Dr. Rose, observed by electron microscopy that penetration of influenza virus into cells was characterized by initial fusion of the viral envelope with the cell membrane, followed by release of nucleoprotein directly into the cytoplasm. In association with Dr. Howe, a closely similar mechanism was found to account for the infection of cells by Sendai virus. In addition, it was observed that lysis of red blood cells was also accompanied by fusion of viral coat and cell membrane. Studies of the entry of herpes simplex virus were continued by Dr. Miyamoto.

In collaboration with Dr. Sam M. Beiser, Dr. Garro completed his investigation of the reactions of anti-pyrimidine-specific antibodies with DNA. Dr. Garro also investigated the possible use of antibodies to fractionate DNA. On completing his requirements for the Ph.D. degree, Dr. Garro was awarded a PHS postdoctoral fellowship to continue his training with Professor Julius Marmur, Albert Einstein School of Medicine. Dr. Rappaport investigated the effect of varying the number of adenosine moieties conjugated per molecule of bovine serum albumin on the antigenicity of the conjugate. These investigations were performed in collaboration with Dr. Bernard F. Erlanger. Dr. Anna Galis continued studies of a dialyzable material active in bacterial transformation. Dr. Beiser served as a member of

the Allergy and Immunology Study Section, National Institutes of Health, and of the Standards and Examinations Committee for Public Health and Laboratory Immunology, American Board of Microbiology.

Dr. Erlanger, in collaboration with Drs. Spyros M. Vratsanos, Marvin C. Lache, Mr. Norbert H. Wasserman and Mrs. Anne G. Cooper, continued a study of the amino acid sequence at the active site of pepsin. In collaboration with Dr. Herman Kaufman, Dr. Erlanger investigated a model system of enzyme photo-regulation in which the control agent is a light-sensitive low molecular weight ligand. Studies on the biological, biochemical and immunochemical properties of anti-nucleoside and anti-nucleotide antibodies were extended with the collaboration of Drs. Beiser and Susan S. Wallace. Additional studies of these antibodies and their relationship to lupus nephritis were carried out in association with Drs. Hsu, Beiser and Beatrice C. Seegal.

Dr. Stuart W. Tanenbaum continued his studies on the biogenesis of acetate-polymalonate secondary metabolites produced by *Penicillia* species. In experiments carried out with Dr. Shoichi Nakajima, it was demonstrated that the biosynthesis of the antibiotic substance pulvilloric acid follows the anticipated polyacetate pathway, and that a single chain fourteen-carbon poly- β -ketid most probably represents the immediate precursor of its ring system. In collaboration with Drs. J. F. W. McOmie and G. C. Barrett, University of Bristol, England, the absolute configuration of pulvilloric acid was determined by circular dichroism measurements on the methyl xanthate ester of a degradation product. Work was undertaken with Dr. Marx on the biosynthesis of methyl triacetic lactone in relation to the formation of stipitatic acid. Extensive purification of the enzyme neuraminidase, obtained from the growth filtrate of a strain of pneumococcus, was carried out with Mr. Joseph Gulbinsky. Together with Dr. Katz, endeavors were focused on the isolation and purification of diphtheria toxin to provide populations of proteins of size and charge homogeneity.

Dr. Goodman and Mr. Stanley G. Sawicki examined the mechanism of acute cytoidal injury caused by the antibiotic actinomycin D in cell culture. It was found that lethal injury affects only growing cultures and that cells in the S (DNA synthetic) phase were selectively affected. Dr. Godman and Dr. Arlene D. Deitch pursued studies of the mechanisms of cytopathic effects brought about by proteins synthesized under viral direction in enterovirus-infected cells. The role of released lysosomal

enzymes in effecting cytopathic changes in the cytoplasm was investigated in collaboration with Mr. Sawicki.

Dr. Rosenkranz continued his studies on the mode of action of hydroxyurea. In collaboration with Drs. Rose and Morgan, the inhibitory effect of hydroxyurea on DNA synthesis was used to study the role of DNA in viral development. Drs. Minda Bitton and Rosenkranz studied the mode of action of the related chemicals nitrosomethylurea and nitrosomethylurethane. Together with Mrs. Kathleen P. Mullinix, a graduate student, the phenomenon of "reversible bacterial death" was described. Dr. Rosenkranz lectured at the Rensselaer Polytechnic Institute and the Sloan-Kettering Institute for Cancer Research. He addressed a symposium on recent landmarks in the DNA revolution in San Francisco, and chaired a session on Chemical Microbiology at the annual meeting of the American Chemical Society.

Drs. Hsu, Seegal and Andres continued their morphologic, immunofluorescence and immunoferitin studies on tissues obtained by biopsy from patients with renal transplants or with various types of nephritis. In association with Dr. Kendrick A. Porter, St. Mary's Hospital, London, England, Dr. Thomas E. Starzl, University of Colorado Medical Center, Denver, and the staffs of II Clinica Medica dell'universita di Roma and Columbia-Presbyterian Medical Center, biopsies from 128 patients were examined during the year. In conjunction with Drs. Beiser and Erlanger, and Dr. Charles L. Christian, Department of Medicine, seven cases of human lupus nephritis were investigated. In association with Drs. Giorgio Tonietti, Lidia Accinni and Maria Purpura, University of Rome, the areas of localization of autoantibodies on the surface of erythrocytes in a case of autoimmune hemolytic anemia were shown by electron microscopy with ferritin-labeled antibody to IgG.

Dr. Harry S. Kessler continued his studies on the tissues of mice that spontaneously develop autoimmune disease and show lesions similar to those that characterize Sjögren's syndrome. In conjunction with Dr. Wladislaw J. Manski (Ophthalmology) the ocular structures and Harderian glands were shown to be involved in the pathologic process.

Dr. Paul D. Ellner, in collaboration with Dr Morello, developed a new type of liquid medium for blood cultures. Dr. Ellner also investigated the possibility of using membrane filters for the simultaneous cultivation and enumeration of bacteria in blood cultures. In collaboration with Dr. Christian (Medicine), the Diagnostic Laboratory continued to

accept specimens from patients at large and in the Arthritis Project for the attempted cultivation of *Mycoplasma*. Dr. Shahidi and Dr. O'Donnell assisted Dr. Ellner as trainees in the program on clinical microbiology. The Diagnostic Laboratory performed a total of 110,357 tests, including 35,069 serologic examinations, which represent an increase of 19% above the preceding year. Fluorescence microscopy was introduced as a routine aid in identifying gonococci and group A beta hemolytic streptococci, and the fluorescent treponemal antibody (FTA) test replaced the *Treponema pallidum* immobilization (TPI) test for the detection of specific syphilitic antibodies in VDRL-positive sera. The rising incidence of gonorrhea in the community was reflected in a marked increase in the number

of strains of *Neisseria gonorrhoeae* that were isolated from patients in the hospital and Vanderbilt Clinic. A computer program was initiated for the more rapid and complete reporting of laboratory test, and for information retrieval.

The department gratefully acknowledges support of its research activities from the American Cancer Society, the George A. Carden, Jr. Special Fund for Cancer Research, The Commonwealth Fund, the Dr. Philip Hanson Hiss, Jr. Memorial Fund, the Matheson Foundation, the Mary Murray Mahoney Memorial Fund, the National Institutes of Health, the National Science Foundation, the Office of Naval Research, the Office of The Surgeon General, Department of the Army, and Harry M. Stevens, Inc.

Neurological Surgery

J. LAWRENCE POOL

Professor and Chairman of the Department • Director of Service

The Department of Neurological Surgery has been awarded a grant from the Department of Health, Education and Welfare to support our developmental graduate training program under the direction of Dr. J. Lawrence Pool and coordinated by Dr. Bennett M. Stein. Dr. Peter Carmel has been appointed Special Fellow allowing him to continue in his research and teaching capacities. The neurological surgery training grant will also support a post-doctoral fellowship designed primarily to train individuals for an academic career in neurosurgery.

Major changes in the departmental curriculum this year include the initiation of an evening teaching session in basic neurological sciences.

Dr. Edgar M. Housepian was honored by being appointed Visiting Professor by the University of Edinburgh and spent the summer participating in departmental research, teaching and clinical responsibilities at the Royal Infirmary, Edinburgh, Scotland. In exchange, Mr. John W. Turner of the Department of Surgical Neurology, Edinburgh, spent the summer with our department.

Numerous foreign Visiting Fellows spent variable periods of time observing in the Department of Neurological Surgery in 1968.

Patient Care

Reconstruction of the radioactive scanning laboratory in the Neurological Institute was begun and when completed in the spring of 1969, will provide greatly expanded and most modern facilities for

isotope scanning of the central nervous system. The recently rebuilt operating room has facilitated stereotaxic surgery and made possible the application of microsurgical techniques in a greater number of cases this year. A technique of elective circulatory arrest, developed at the Neurological Institute, has been successfully carried out in a number of cases of dangerous aneurysms of the basilar artery.

In the past year 1088 surgical procedures were performed at the Neurological Institute, a 10% increase over the previous year. 997 were major operations of which 448 were craniotomies, 367 laminectomies and 182 miscellaneous procedures such as carotid endarterectomy, stereotaxic surgical procedures and a variety of spinal fluid shunts. Forty-one minor operations and 50 diagnostic procedures were also carried out in the past year.

Harlem Hospital

Members of the Neurosurgical Service have continued to participate in rounds and conferences in a consultative capacity at the Harlem Hospital.

Staff Activities

Dr. Pool delivered the annual Van Wegenen Memorial Lecture in Rochester, New York where he discussed the management of ruptured intracranial aneurysms. He was invited by the New York Academy of Sciences to discuss rehabilitation of the carcinoma patient at a conference in Princeton, New Jersey. As guest lecturer of the Virginia

Neurosurgical Society. Dr. Pool discussed aneurysms and the treatment of large acoustic tumors. He also delivered addresses on these topics at the Downstate Medical Center, St. Vincent's Hospital and Medical Center and before the Greenwich Hospital Association.

Dr. Pool has continued to develop microneuro-surgical techniques for the treatment of vascular malformations and aneurysms of the brain and spinal cord and in the surgery of cerebellar pontine angle tumors, and has participated in a symposium on this subject in Zurich, Switzerland. Dr. Pool is currently participating in studies on experimental vasospasm with Doctors Stein and Fraser.

Dr. Edward B. Schlesinger was elected President of the New York Neurosurgical Society. During the past year his studies related to cerebro-spinal fluid dynamics were fruitful and have led to new diagnostic opportunities.

Significant improvement in the automation of scanning was achieved by Dr. Schlesinger's radio-isotope laboratory. His utilization of improved computer and programming techniques has become the prototype for such applications in isotope scanning. He discussed scanning methodology and new aspects of intrathecal isotope usage at meetings of the American Association of Neurological Surgeons, the American Neurological Association and the Neurosurgical Society of America.

Dr. Lester A. Mount has continued his interest in the study of the long term results of surgery in patients with premature synostosis. As a member of the subcommittee on Classification and Nomenclature of the Joint Council on Cerebrovascular Disease of the National Institute of Health, he has continued his clinical research in cerebrovascular disease. He has engaged in a clinical survey of spontaneous cerebrospinal fluid rhinorrhea with Drs. Ronald Brisman and James Hughes. Dr. Mount was elected an honorary member of the Society of British Neurological Surgeons and served again with Project Hope in Colombo, Ceylon where he also lectured at the University of Colombo.

Dr. James W. Correll in collaboration with Dr. Ernest Wood (Radiology) and Dr. Frank Boschenstein (Neurology) has contributed to the increased understanding of problems of occlusive cerebrovascular disease. A clinical correlative study was completed which proved the importance of ulceration of atherosclerotic plaques as an important source of embolization in these conditions. The accuracy of transcutaneous Doppler ultrasonics in evaluating the blood flow in the extracranial arteries was studied with Drs. Brisman and Grossman by comparing re-

sults obtained before operation with direct measurements of carotid flow made during surgery.

Dr. Correll has continued his investigations of the influence of the cerebral nervous system on lipid metabolism. Dr. Correll participated in an International Conference on Microcirculation in Gothenburg, Sweden, where he discussed his evidence for central neural control on blood clotting mechanisms. This work was also presented at the American Academy of Neurological Surgery in Colorado Springs, Colorado.

Dr. Edgar M. Housepian, continuing his interest in stereotaxic surgery for pain, epilepsy and movement disorders, has further revised stereotaxic surgical techniques, materially reducing operating time while improving the accuracy and safety of these procedures. As a result of these improvements of operative technique, thalamic biopsies have been made available to Dr. Lucien Cote (Neurology) for histochemical enzymatic analysis.

In collaboration with Dr. George Krauthamer (Neurology), Dr. Housepian has been preparing to record the electrical activity of single thalamic cells. This mapping of spontaneous and sensory evoked thalamic potentials will provide the method for future investigations of subcortical interrelations in man.

As a result of collaborative project involving Dr. Housepian, Dr. William Bauman, Director of Medical Data Processing, and Mr. Gerald Heltzman and Mr. Abe Yellen of that Department, the Data Processing Center now provides the monthly reports on surgical census, professional activity, complications and infections. Work is in progress on programs for processing of narrative information which will provide greater ease and accuracy in data acquisition, storage, and retrieval of a wide range of data. These methods will facilitate correlative studies for improvement in patient care and clinical research.

Dr. Housepian has continued his interest in the treatment of orbital tumors and lectured on this topic before the American Association of Neurological Surgeons and as guest lecturer at the Royal College of Surgeons, Edinburgh. Dr. Housepian participated in a basic science seminar of the United States Naval Hospital, St. Albans, where he lectured on clinical and electrophysiological studies of the human thalamus.

Dr. Thomas Bridges has continued his interest in the treatment of intractable pain and has made contributions to the further development of the percutaneous electrical cervical cordotomy. He continues his investigations of the cerebral plethysmogram.

Dr. James McMurtry has continued the evaluation of Rhenomacrodex in the treatment of intracranial aneurysms and it is hoped that this program will result in the availability of this drug to all physicians in the coming year. A three and one-half year follow-up study of twenty-one patients with hydrocephalus treated by ventriculo-arterial implant shunts has been made with Dr. Ronald Brisman.

Dr. McMurtry has been working with Dr. William Amols (Neurology) on a combined medical-surgical approach for the treatment of trigeminal neuralgia. He was a participant in an international symposium on this subject held in New York.

Dr. Bennett Stein is currently studying the cerebellar connections of the vestibular and cochlear systems. He has completed an anatomic study of the projections of the dorsal roots within the spinal cord and the brain stem in collaboration with Dr. Malcolm Carpenter (Anatomy) and Dr. Joyce E. Shriner (Anatomy). Dr. Stein is engaged in the comprehensive study of cerebrovascular spasm as related to neuropharmacological control of cerebral vessels with Drs. Pool, Richard Fraser and Robert L. Barrett.

Dr. Stein's clinical interests have been primarily in the field of pediatric neurosurgery and with Dr. Peter Carmel he is engaged in a clinical appraisal of surgery in the newborn with meningomyelogole. A new surgical technique of supra-cerebellar approach in the treatment of pineal tumors was reported to the Congress of Neurological Surgeons in Toronto. Dr. Stein has instituted a course in neuro-anatomic-clinical correlation for graduate nurses of the Neurological Institute. He also participated in postgraduate courses in neuropediatrics where he discussed head injuries and hydrocephalus and in neuro-ophthalmology where he lectured on neuro-surgical disorders with neuro-ophthalmological implications.

Dr. Peter Carmel presented a report of his investigations with Dr. Stein on ganglion cell damage following rhizotomy and neurotomy at a meeting of the American Anatomical Association. He is continuing his anatomic studies of efferent and autonomic pathways of the ventral anterior thalamic nucleus with Dr. Carpenter. Investigations of hypothalamic-ovarian interaction in monkeys have been started in conjunction with Dr. Raymond Vandewicke (Obstetrics and Gynecology).

Resident Activities

During the past year Dr. Jost Michelsen working with Dr. Sadek Hilal (Neuroradiology), and Mr. Jack Driller of the Riverside Research Institute has developed a "swimming" or "pod" catheter allowing cannulation of tortuous vessels using an external alternating magnetic field to guide the tip. Extensive laboratory research is being conducted to perfect techniques for use of the catheter in the treatment of experimental aneurysms. Dr. Michelsen, working in Dr. Schlesinger's isotope laboratory, studied the CSF circulation with RISA. An hypothesis for the development of the syndrome of "normal pressure" hydrocephalus was advanced as a result of this work.

Dr. Richard A. R. Fraser, working with Drs. Pool and Stein has pursued the problem of cerebrovascular spasm in the laboratory. He has developed a micro-surgical transclival approach to the basilar artery in the Rhesus monkey, and has studied induced vasospasm and the effects of catecholamines and catecholamine releasing agents on vessel tone. The role of the noradrenergic periarterial nerve plexus demonstrated by a catecholamine fluorescent technique has been studied with technical assistance provided by Dr. Robert Barrett (Neurology). These studies suggest that cerebral vascular spasm is mediated through an alpha adrenergic receptor in the arterial wall. Dr. Fraser presented this work at a meeting of the Congress of Neurological Surgeons in Toronto.

An anatomic study of the projections of the globus pallidus in the Rhesus monkey was completed with Dr. Carpenter. Impedance profiles of the brain were studied with Dr. Carpenter and provided for accurate localization of subcortical structures.

Acknowledgments

We deeply appreciate the research support we have been given by various organizations and individuals. Among them are The John A. Hartford Foundation, the United States Public Health Service, the John Gunther, Jr. Memorial Gift, the Cerebral Vascular Gift Account, the Cross Ridge Foundation and the Fairchild Space and Defense System; as well as numerous individual gifts to the Neurosurgical Research Fund by friends and patients as well as members of our own department.

Neurology

RICHARD L. MASLAND, M.D.

Professor and Chairman of the Department • Director of Service

The Department of Neurology, with its program based at the Neurological Institute, providing 246 beds for service, teaching and research in the neurological sciences, has long served as a leading center in this field.

In June 1968, Dr. Richard L. Masland joined the department as Professor and Chairman. Over the past ten years, Dr. Masland was Assistant Director and Director of the National Institute of Neurological Diseases and Blindness.

The department was saddened by the death of Dr. L. Beverley Chaney, retired Clinical Professor of Neurology. Dr. Chaney's association with the Medical Center extended over a period of thirty-five years until his retirement in 1953.

On June 30, 1968, Dr. Maximilian Silbermann retired as Assistant Clinical Professor of Neurology, having been in the department since 1944.

New appointments include Drs. Sid Gilman, Mark A. Goldberg and Noel Morlock as Assistant Professors of Neurology.

Three senior members of the department recently resigned — Dr. Wolf-D. Dettbarn to become Professor of Pharmacology at Vanderbilt University. Dr. Philip Rosenberg to become Professor and Chairman of the Department of Pharmacology at the University of Connecticut and Dr. Stanley Fahn to become Assistant Professor of Neurology at the Hospital of the University of Pennsylvania. Dr. Gerald E. Gaull left the department to join the faculty of Mount Sinai Medical School.

The teaching and research staff of the department

was augmented by the addition of the following: Research Associates: Toyohiro Akiyama, Florry P. Bowen, Dante J. Chiarandi, Joe E. Coward (Microbiology), Walter J. Deal, Jr., Harvey Ebel, William H. Gordon, Hideo Hayashi, Gerald G. Lovinger, Joav Prives and Shunichi Yamagishi. Instructors: Fidel V. Exconde, Jr., L. William McLain, Jr., Gail E. Solomon and M. Richard Koenigsberger. Assistants: Martha B. Denckla, Amal M. M. Mahfouz and Saul Puszkin.

Patient Care

This year over 1,600 adult patients were admitted to this service for diagnosis and treatment. In the Pediatric Neurology Service there are 25 beds for children with an average daily hospital census of about 25 patients.

The neurology out-patient clinics, among the most active in the world, provided over 16,000 patient visits. Within these clinics, there has developed a high degree of specialization, with special programs in adult and pediatric neurology, cerebral palsy, epilepsy, Parkinsonism and muscle disorders. Additional new interests this year are on the neurological evaluation of the infant; child development and dyslexia in children.

In addition, the department now has professional responsibility for the Neurology Service at the Harlem Hospital under Dr. Ralph W. Richter, who supervises two of the seven acute wards. The Harlem Pediatric Neurology Service, under the supervision of Dr. M. Richard Koenigsberger, has estab-

lished a Developmental Clinic to care for patients with behavioral and learning problems.

Neurological consultation services were provided at Harlem Hospital for 1,360 in-patients and there were 1,800 out-patient visits.

Research and Special Programs

The Parkinson's Disease Research and Information Center, under the direction of Dr. Melvin D. Yahr, has now completed its fifth year of operation. In addition to its research activities, it has become an active training center in neurobiology. During the past year, four undergraduates, three medical students, two predoctoral candidates and two postdoctoral fellows participated in the Center's activities.

Based on previously demonstrated defects in catecholamine metabolism in Parkinsonism, an intensive effort for its correction was undertaken. During the past year treatment of Parkinsonism with L-DOPA, the precursor of dopamine which has been found to be markedly reduced in substantia nigra and caudate nucleus, was undertaken. Preliminary evaluation of results indicate significant improvement in the symptoms of Parkinsonism in 75% of the patients treated. Further efforts to refine this approach to therapy utilizing various techniques to prevent utilization of L-DOPA in peripheral structures and concentrate its effects in brain are now under investigation. These studies are being intensively pursued by Drs. Yahr, Roger C. Duvoisin, Robert E. Barrett, Margaret G. Hoehn and Myrna Schear. In addition, in collaboration with Drs. Lucien J. Cote and Stanley Fahn, studies on the distribution of L-DOPA and homovanillic acid one of its major metabolites, in blood and spinal fluid, are underway so that better guidelines to dosing schedules of L-DOPA can be defined.

The results of the long term follow-up study of patients having had stereotactic surgery for Parkinsonism were presented by Drs. Hoch and Yahr.

Dr. Duvoisin, in collaboration with Dr. Melvin Stern (Massachusetts Mental Health Center, Boston) and Dr. Howard Roffwarg (Psychiatry, Montefiore Hospital), published a paper on relationship of tremor to sleep in Parkinson's disease. Dr. Duvoisin, working with Dr. Ronald Katz (Anesthesiology), has prepared for publication a report on the clinical effect of physostigmine on intoxication due to scopolamine and related drugs. Dr. Duvoisin with Dr. George Crane (National Institute of Mental Health) and Dr. David Kurland (Spring Grove State Hospital, Maryland) made a study of phenothiazine-induced tardive dyskinesias.

Dr. Florry Proctor Bowen has established a pro-

gram to study the effects of L-DOPA on sensorimotor behavior of Parkinsonian patients.

Dr. Soll Berl, with Dr. Tamas Frigyesi (Albert Einstein College of Medicine), continued his studies on the turnover of glutamic acid, glutamine aspartic acid and -aminobutyric acid in the caudate nucleus, thalamus and sensorimotor cortex of the cat. They were able to follow the metabolic rates of these amino acids by labelling them with 1^{14}C -acetate administered intravenously.

Dr. Berl, with Dr. Donald D. Clarke and graduate student, William J. Nicklas (Chemistry, Fordham University), has continued his studies on the metabolic compartmentation of glutamic acid and its associated metabolites utilizing guinea pig brain slices. Neurotoxic substances such as fluoracetate, fluoropyruvate, fluorocitrate and fluoride as well as aminoxyacetic acid have been investigated and each has been found to produce characteristic affects on the metabolisms of these amino acids.

Drs. Berl, Saul Puszkin and Elena Puszkin (Mt. Sinai School of Medicine) have isolated from the rat and cat brain a protein with contractile, actomyosin-like properties. It has a number of properties resembling those of muscle actomyosin.

Dr. George Krauthamer has continued his investigations of the interrelationship between the basal ganglia and polysensory afferent activity.

Depth electrode recordings are being used to map out brain stem and cortical evoked potentials, and to determine excitability changes in single neurones of the brain stem reticular formations following peripheral and central stimulations. Collaborating in these investigations with Dr. Krauthamer are Mario Delsass and a visiting scientist, Dr. C. Y. Chai (National Defense Medical College, Taiwan, China). Dr. Chai will return to his post at the end of the year.

Dr. Sid Gilman completed studies started at Harvard on the mechanism of cerebellar hypotonia and on fusimotor fiber responses in the decerebellate cat.

Dr. Harvey C. Ebel is working on a series of studies to assess the effects of variables related to the mechanism of the behavioral deficit (i.e., delayed response) which is most prominently associated with lesions in the basal ganglia-prefrontal cortex complex.

Dr. Cote is studying the metabolism of L-DOPA in patients receiving this treatment of Parkinson's disease. He is investigating the pattern of absorption of L-DOPA from the human gastrointestinal tract, the mechanism(s) by which it is taken up by the brain and its metabolism in various organs. He has observed, and is now identifying, a number of

metabolites of L-DOPA in the urines of treated patients. Dr. Cote has been studying the enzymes involved in catecholamine synthesis in brains of experimental animals and man.

Drs. Abner Wolf, Sara Ginsburg and Cote are testing catecholamine analogues to produce an experimental model for Parkinson's disease in animals.

Dr. Leon T. Kremzner is continuing studies of the aggregation (formation of multiple molecular weight forms) of the enzyme acetylcholinesterase. In collaboration with Dr. Philip Rosenberg, he is also continuing studies regarding the essentiality of acetylcholinesterase to nerve conduction.

Dr. Kremzner is also studying the metabolism of polyamines (putrescine, spermidine and spermine) in the nervous system, and with Drs. Philip Duffy and Richard F. Defendini (Neuropathology) the extent to which polyamine metabolism is altered in central nervous system tumor tissue; preliminary studies indicate marked alterations occur.

Drs. Kremzner and Cote have completed a study of the relationship of polyamine metabolism to nucleic acid synthesis. A study has begun to isolate and purify the enzyme catalyzing the synthesis of spermidine.

Dr. Wolf, with Jerry R. Mendell, Mastri and William Markesberry (Neuropathology), is studying two instances of progressive supranuclear palsy. An investigation of the functional and morphological effects in white rats and rhesus and squirrel monkeys of antimetolites to dopa and tyrosine are continuing. As yet no extrapyramidal syndrome has been produced. In spite of reduction in caudate content, morphological changes have not been observed at the light microscopic level. Such changes are now being sought by Drs. Cote and Barrett by fluorescence methods and at the light microscopic level by Drs. Cote, Mastri and Markesberry.

Dr. Barrett has conducted histochemical and pharmacological research with Drs. Ermino Costa and Norton Neff (now at National Institute of Mental Health) to discover the localizations of noradrenaline and serotonin in the pineal gland and to study the mechanisms of their depletion. Similar studies on the level of electron microscopy have been carried out with Dr. Duffy. Catecholamine and indolealkylamine localization in neurons of the sympathetic nervous system is being studied by Drs. Barrett and Tennyson and Adam Bender (student), using combined histochemical, pharmacological and electron microscopy techniques.

Mr. Herbert Barden (Neuropathology) is pursuing two histochemical approaches towards gaining

an understanding of the relationship of neuro-melanin and lipofuscin.

The electron microscopic-cytochemical technique for the localization of cholinesterase developed in this laboratory has been used by Dr. Tennyson to study the development of cholinesterase in the embryonic nervous system. The results of parallel biochemical determinations of enzyme activity in collaboration with Miro Brzin (University of Ljubljana, Yugoslavia) are being published.

A study of developing cardiac muscle done in collaboration with Dr. Martin Hagopian (Pathology) has been reported by Dr. Tennyson. ChE is present in the reticulum of cardiac muscle of the pulsating embryonic heart before the formation of the T-tubules and the ingrowth of nerve fibers. This supports the concept that ACh-ChE system may be involved in ionic events underlying spontaneous contractions of cardiac muscle.

Studies are in progress using the peroxidase method of Karnovsky to test the permeability of cell junctions in an attempt to further define the embryonic blood-brain and blood cerebrospinal fluid barrier by more physiological means.

Dr. Frederick A. Mettler has pursued two lines of approach to problems of upper level control of muscular movement. The first, stemming from the discovery that lesions of the nucleus accumbens septi temporarily releases ipsilateral choreoathetosis, reveals that there is an apparent relationship between the driving force behind choreoathetosis and that encountered in striatal or interpeduncular lesions. The second approach derives from the discovery that chronic administration of sodium azide produces hyperkinetic manifestations and that these appear *before* any neuropathologic changes can be demonstrated by the light microscope. Electron microscopic examinations of these suspected areas are being conducted by Dr. Sarah Luse (Anatomy). It has also been found that when sodium azide is administered as a bolus, focal cerebellar degeneration may be produced. This may be due to edema and provides a model for the investigation of cerebellar edema (and degeneration) and also for a study of the origin of the cerebellar climbing fibers. Dr. Daniel Sax (Montefiore Hospital) is now pursuing this and related approaches. Dr. Isidore M. Tarlov (formerly, New York Medical College) has directed his attention to the investigation of chronic local tetanus with a view to elucidating the "stiff-man syndrome".

The department continues to emphasize its concern for the crippled child through its program in

pediatric neurology under the direction of Dr. Sidney Carter.

One of the most difficult areas of pediatric neurology is the neurological evaluation of newborn infants. The determination of true post-conceptual age of the neonate provides an essential frame of reference for determining the prognosis and management. Dr. Koenigsberger has been placed in charge of a new unit devoted to neurology of the newborn and has established a laboratory in the Columbia-Presbyterian Medical Center Premature Unit for the study of low birth weight infants. Special studies include electroencephalography, peripheral electrical measurements and vestibular studies. Other parameters will be measured as experience increases. The fellows in pediatric neurology will learn newborn neurology in the laboratory and will have an opportunity to spend part or all of their elective time there.

Dr. John F. Nicholson (Pediatrics) has extended his studies on the metabolism of N¹⁵ labeled compounds to subcellular systems in the laboratories of Professor E. C. Slater at the University of Amsterdam, The Netherlands, from January to September, 1968. He is now responsible for the investigation of infants and children having inborn errors of metabolism, and has established a screening program for the presence of possible metabolic errors in all children admitted to the Pediatric Neurology Service.

Dr. Sadek Hilal (Radiology) has joined Drs. Carter, Arnold P. Gold and Gail E. Solomon in a follow-up study of infantile acquired hemiplegia.

Dr. Martha B. Denckla has started a clinical program to study the neurological factors in dyslexia.

The "distant" neurological manifestations of tumors in other organs, e.g. bronchiogenic carcinoma, in adults are now well recognized. Drs. Abe Chutorian and Solomon studied two children with opsoclonus and ataxia in whom they were able to demonstrate an associated neuroblastoma.

Drs. Chutorian, Gold, Koenigsberger and Malcolm Schvey (Otolaryngology) have reported on impaired vestibular function in seventeen children with recurrent episodes of dizziness.

Drs. William Tasker and Chutorian reported the results of steroid therapy in children, ranging in age from two to fourteen years, with non-hereditary chronic polyneuritis.

The Neurovirology Laboratory, under the direction of Dr. Donald H. Harter, is conducting studies of the biologic properties of visna virus, the cause of a slowly-evolving encephalitis of sheep; and at-

tempts to isolate the virus which causes a lethal encephalitis of children and adolescents called subacute sclerosing panencephalitis.

With Dr. Richard P. Bunge (Anatomy), Dr. Harter studied the effects of visna virus on differentiated tissue cultures prepared from newborn mouse cerebellum. Under these conditions, demyelination is produced suggesting an approach to the problem of multiple sclerosis.

Dr. Councilman Morgan (Microbiology) is studying by electron microscopy the growth of visna virus in tissue culture cells. With Drs. Konrad Hsu and Harry M. Rose (Microbiology), Dr. Harter also found that visna virus multiplies in continuous cell lines prepared from grazing animals, which should make it easier to grow and study visna virus in the laboratory.

Drs. Harter and Herbert Rosenkranz (Microbiology) have performed experiments to determine the chemical composition of visna virus nucleic acid. The results indicate that visna virus contains ribonucleic acid (RNA).

Dr. Harter has continued his attempts to isolate the virus responsible for subacute sclerosing panencephalitis. With Drs. Carter and Gold, Dr. Harter has prepared cell cultures from brain tissue obtained from patients with this form of encephalitis and is studying these cell cultures to see if they harbor measles or a similar virus.

Drs. Eli S. Goldensohn and L. William McLain have been studying the mechanisms involved in the production and transmission of electrical seizure discharges related to epilepsy. The coordinated studies include experimental preparations, tissue cultures and man. Intracellular electrical recording techniques from single neurons are used to study low voltage fluctuations in neural membranes, which they have found to be related to random ionic flux. Their investigations with Dr. Margaret Murray (Anatomy) include intracellular and extracellular recordings from the same neurons in tissue culture. Mr. Leonard Zablow is collaborating with Drs. Goldensohn and McLain in the computer analysis of single unit activity in the experimental preparations. Studies on single units during cortical surgery for seizure control are being attempted by Drs. Goldensohn and Fidel V. Exconde with Drs. Steir and Edgar Housepian (Neurological Surgery). Dr. Solomon, Mr. Zablow and Dr. Goldensohn are investigating the significance of occipital slowing of the EEG in the posterior head regions of apparently normal subjects.

Investigation of several new drugs continued dur-

ng 1968 in the out-patient clinics, i.e. Tegretol for trigeminal neuralgia in the Adult Neurology Clinic, L-DOPA in the Parkinson Clinic, and La-1 and D-spolut in the Child Neurology and Seizure Clinics. Dr. Maurice H. Charlton is continuing his study of the electroencephalograms of patients subject to cardiac surgery, with the Department of Surgery and Department of Psychiatry. He has embarked on a study with Drs. Paul F. A. Hoefer and James Mellinger of the clinical characteristics and treatment of infantile spasms.

Patients with myopathies and peripheral neuropathies have been seen in the special clinic in Vanderbilt Clinic by Dr. Robert E. Lovelace where he has been assisted by Drs. Markesberry, M. Gonzalez (Visiting Fellow) and S. Sun (Neuropathology), and in the Myasthenia Gravis Clinic, which is directed by Dr. Hoefer, assisted by Drs. Markesberry and William H. Gordon.

In the Clinical Electromyography Laboratory from October 1, 1967 to September 30, 1968, 655 electromyograms and 653 nerve conduction studies were performed; a total of 1308 tests.

Drs. Hoefer, Lovelace and Mr. Zablow, continuing their microelectrode studies of human muscle *in situ*, have established the normal parameters of the observed responses. They are now turning to the study of diseased states of nerve and muscle.

Dr. Lovelace has developed an animal research laboratory for peripheral nerve and neuromuscular disorders. With Dr. Gonzalez, he has undertaken a series of experiments on animals treated with diphenylhydantoin on an acute and chronic basis.

Dr. Lovelace and Dr. Richard A. Armstrong with Drs. Koenigsberger and Mellinger, have investigated two families with the central core type of congenital myopathy using clinical, electromyographic, histochemical and electronmicroscopic studies.

Dr. Lovelace has continued his studies of Pompe's disease of muscle and the case previously referred to is now to be published with Drs. James M. Boradiul and Sidney Blumenthal (Pediatrics). Dr. Lovelace, with Drs. Armstrong, Lawrence Fishman and Gonzalez, is also investigating a family with three siblings involved with the late juvenile muscle variant of glycogen storage disease presenting with vacuolar myopathy and anterior horn cell disease using electromyographic, histochemical and electronmicroscopic studies. Drs. Lovelace and Roger N. Rosenberg investigated the peripheral nerve disorder in lepromatus leprosy. Drs. Lovelace and Earl

A. Zimmerman have completed their studies on the neuropathy in acute intermittent porphyria using biochemical, electrophysiological, histological techniques (including nerve fiber dissection).

Drs. Lovelace and Carter have analyzed 78 patients with Charcot-Marie-Tooth, Roussy-Levy, and Friedreich's ataxia disorders.

Dr. Arnold P. Friedman continued his studies on certain phases of the biochemical and pharmacological responses of patients with vascular headaches of the migraine type; and, special studies on nocturnal headaches and on retroperitoneal fibrosis in patients taking methysergide; also, investigations on chemical agents in the symptomatic and prophylactic treatment of headache.

Active in the Department of Electroencephalography, in addition to Dr. Hoefer, are Drs. Margaret R. Seiden, Charlton and Lovelace (part-time). During the period from November 1, 1967 to October 31, 1968, a total of 8034 electroencephalograms were performed, again, an increase over former years.

Mr. Zablow with Dr. Goldensohn compared EEG readings of scalp needle and disc electrodes. Mr. Zablow is continuing his work on a model for the cortical localization of EEG foci as well as computations of scalp potential distributions due to cortical dipoles at specific locations. The LINC-8 computer has been programmed and will be modified for use on computations of EEG potentials.

The EEG Department is cooperating with Dr. Marguerite J. Gates (Pediatrics) in a federally sponsored Child Development Study.

The laboratories for electroencephalography and electromyography on the 13th floor of the Neurological Institute, which have been in use without change since 1940, have been redesigned, modernized, and are being rebuilt at this time. It is expected that they will be functional again on March 1, 1969. For the time being, our activities are spread over the entire hospital complex.

During the calendar year of 1968, the following work was done in the Division of Neuropathology: autopsies from the Neurological Institute and from the Pediatric Neurology Service, 52; brain examinations from the Presbyterian Hospital, Harkness Pavilion and outside sources, 243; brain examinations from Babies Hospital, 112; brain examinations from Sloane Hospital, 27; fresh tissue examinations in operating room, 100; Surgical biopsies from the Neurological Institute, 656; cerebrospinal fluid millipore examinations, 108.

Drs. Geller, Cowen and Wolf are continuing

their study, in rats, of the possibility of overruling or ameliorating the retarding effects of prenatally-induced brain damage upon later learning and memory abilities, by treatment of the injured animal during its early development.

Completed during this year was a study by Drs. Cowen, Geller and Wolf of the reaction of the developing brain of the rat to closed-head electro-thermal injury induced at 4-5 days of age.

With Dr. Mario Kornfeld (University of New Mexico School of Medicine) and Dr. Franz Altman (late Professor of Otolaryngology), Drs. Geller, Cowen and Wolf have also completed a study of the ototoxic effect of 6-aminonicotinamide, a potent antimetabolite of nicotinamide, in two strains of mice. One of these was highly susceptible to sound-induced seizures.

Dr. Duffy, together with Dr. Markesberry, is studying the ultrastructure of the pineal gland and of the median eminence, with particular attention being paid to the nerve endings. Dr. Duffy is also studying storage diseases with material obtained from human biopsies. Tissues from cases of lipidoses or other storage diseases are being examined by light, phase, and electron microscopy. An attempt is being made to correlate these observations with biochemical determinations, using fresh frozen tissues. An entity titled, neurovisceral storage disease with curvilinear bodies, has been described. With Drs. Defendini and Kremzner, Dr. Duffy is also studying brain tumors electron microscopically and biochemically. Dr. Kremzner's laboratory is determining their polyamine levels. Ultrastructural studies of peripheral nerves obtained by biopsy from cases of peripheral neuropathies are also being carried out by Dr. Duffy. These cases are being studied electromyographically by Dr. Lovelace.

Other investigative work in the Division of Neuropathology includes a study of the delayed effects of radiation on the cat brain by Drs. Mastri and Chu Chang (Radiology).

The staff of the laboratory of neurophysiology comprises Drs. Harry Grundfest, John P. Reuben, George M. Katz and Noel L. Morlock. Dr. Yasuo Hori has returned to Japan as Assistant Professor of Physiology at Osaka University. Research Associates in the department are: Drs. Dante Chiarandini (formerly USPHS International Fellow), Hideo Hayashi (University of Tokyo), Toyohiro Akiyama (Tokyo Medical and Dental University), Robert W. Meech (University of Southampton), Franco Ruiz-Manresa (Central University, Caracas) and Shunichi Yamagishi (Tokyo Medical and Dental University).

The following were guest investigators during the summer's work at the Marine Biological Laboratory, Woods Hole: Drs. Bogdan B. Beleslin (Belgrade), Philip B. Dunham (Syracuse University), Alan R. Freeman (Rutgers), Tara Furukawa (Osaka City Medical School), Lucian Girardier (Geneva) and two fellows of the Grass Foundation (Dr. Meech and Mr. Ernest April). Mrs. Martha Sorenson (Zoology, University of Washington) continues as a guest investigator. Dr. Alexander Mauro (Rockefeller University) continues as a Visiting Lecturer.

The exploitation of the channelled current hypothesis of excitation-contraction coupling continues to be a major interest that is being pursued by Drs. Reuben, Chiarandini, Orentlicher, Katz and Grundfest, with the collaboration of Dr. Philip W. Brandt (Anatomy) and Mr. April. Mrs. Sorenson is continuing work on frog and crab muscle fibers and Dr. Orentlicher is continuing an analysis of the effects of certain dyes in membrane of crayfish muscle.

Drs. Motokizawa, Reuben and Grundfest completed an analysis of the anion permeability of inhibitory synapses of lobster muscle. Drs. Epstein and Grundfest demonstrated desensitization of the inhibitory membrane of crab muscle to gamma-amino-butyric acid as well as presynaptic inhibition of GABA. Drs. Hori and Grundfest studied further the ionic properties of mealworm muscle fibers. Drs. Ruarte, Ruiz, Schwartz and Grundfest continued studies on eel electroplaques and by a new method confirmed the unique characteristics of their spike electrogenesis. Drs. Dunham, Freeman and Grundfest continued studies on membrane properties of lobster and squid axons. Dr. Yamagishi applied voltage clamping to squid axons that were entirely depleted of axoplasm and perfused with various solutions.

The main interest of the group, directed by Dr David Nachmansohn, has increasingly shifted to the analysis of the two proteins in the excitable membranes which are directly associated with the generation of bioelectricity: acetylcholine (ACh) - esterase and -receptor. These two protein initiate and control the permeability changes during electrical activity, a key problem in the understanding of the propagation of nerve impulses.

Last year Dr. Walo Leuzinger had succeeded with the large scale purification and crystallization of ACh-esterase. This accomplishment opened the possibility of studying the molecular properties of this enzyme. Developments in several fields have shown that such information, including eventually the three-dimensional structure of the crystal, may provide

important clues for the understanding of cellular mechanisms. The most important advance during the last year in the studies of ACh-esterase was the evidence that the molecule is formed by four subunits of equal molecular weight (M.W.). The exact M. W. of ACh-esterase was determined to be 260,000, that of each of the subunits of 65,000. It was found, by end group analyses, that there are two different polypeptide chains, as is known to be the case for the hemoglobin molecule. Analysis with three different methods have shown, in excellent agreement, that there are only two active sites. Thus, it seems that the molecule is formed by two dimeric hybrids.

Important advances in the analysis of the ACh-receptor came from the continuing studies of the noncellular electroplax preparation. Last year, Dr. Jean-Pierre Changeux (Institut Pasteur, Paris) had succeeded, in collaboration with Dr. Thomas R. Podleski, to "affinity label" the ACh-receptor. This affinity labeling is produced in extremely low concentrations, 10^{-7} to 10^{-8} M. This indicates the high specificity of the reaction. The compound, made radioactive, may lead to the isolation of the receptor. Many enzymes have been isolated, but so far not a single receptor protein has been obtained in solution.

An account of the work of the Immunochemical Laboratories which is carried out jointly in the Departments of Microbiology and Neurology under Dr. Elvin A. Kabat will be found in the report of the former department.

Dr. Richard L. Masland received a citation for Meritorious Service in 1968 from the National Easter Seal Research Foundation for Crippled Children and Adults, Inc. He is a member Medical Advisory Board of National Multiple Sclerosis Society and Muscular Dystrophy Associations of America, Inc.; member of Board of Directors, National Foundation for Neuromuscular Diseases, Inc. member of Secretary's (H.E.W.) National Advisory Committee on Dyslexia and Related Reading Disorders.

Dr. Sidney Carter is Director, American Board of Psychiatry and Neurology, Inc.; Special Con-

sultant and member of the Board of Scientific Councilors of the National Institutes of Health (NINDB); Chairman-Secretary, Research Group on Migraine and Headache of the World Federation of Neurology.

Dr. Melvin D. Yahr was elected President-Elect of the American Neurological Association and appointed a member of the Special Medical Advisory Group to the Director of the Veterans Administration.

Dr. Eli S. Goldensohn was appointed Visiting Professor of Medicine (Neurology) at Stanford University Medical School for the month of February. He was elected President of the American Epilepsy Society and the Eastern Electroencephalographic Society.

Dr. Abner Wolf received an Award for Distinguished Service to Neuropathology from the American Association of Neuropathologists.

Dr. Francis C. G. Hoskin spent his sabbatical year with Professor Hans Kornberg at the University of Leicester, England and worked there on biochemical control mechanisms.

Dr. Thomas R. Podleski joined Dr. J. P. Changeux at the Institut Pasteur for a period of two years to help to introduce the electroplax preparation there. Dr. Israel Silman has now returned to Weizmann Institute in Rehovot, Israel.

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Nursing

MARY I. CRAWFORD

Professor and Chairman of the Department • Director of Service

The nursing department has again spent the last year striving toward two major goals: providing the highest quality of nursing care to patients in the Columbia-Presbyterian Medical Center, and preparing nurses capable of providing the highest quality of comprehensive health care to all people in any community in which they decide to work. Nursing faculty and nursing personnel have been exploring with the medical staff the role of the nurse in many different clinical areas, the most effective use of the services of all nursing personnel in patient care, and how nursing personnel can best be prepared to provide these services.

Two highly respected members of the department retired in 1968. Miss Elizabeth Gill had been with the department for thirty-four years. Since 1961 she had served as Associate Dean and Director of Nursing. Miss Florence Vanderbilt served as Director of Residence and Student Health for twenty-one years. She had been with the department for forty-five years. Two other long-time members of the faculty resigned: Mrs. Harriet Deleuran, Director of Recruitment, and Dr. Dorothy Reilly, in administration. Miss Sarah Sheets is on leave of absence to complete her master's degree. New appointments include Dr. Mary I. Crawford as Associate Dean and Director of Nursing, Miss Gloria Steffens in administration, Mrs. Evelyn Bright as Director of Residence and Student Affairs, and Mrs. Andrea Fisher as Director of Recruitment. Appointments in the graduate nursing programs include Mrs. Geraldine Brown in psychiatric-community

health nursing and Miss Ruth Helmich in maternity nursing. In the undergraduate nursing program new appointments include Miss Susan Winickoff in behavioral sciences, Miss Joan Dirkmaat and Miss Lucy Warren in pediatric nursing, and Miss Gloria Gilbert and Miss Bettie Springer in medical-surgical nursing. Mrs. Elizabeth Pearson transferred from the behavioral science faculty to take charge of the undergraduate course in psychiatric nursing. All appointments in the practical nurse program are new. Miss Edith Ankers is Director and Miss Nuh Dabbeekeh and Mrs. Louise Battiatto have been appointed as Instructors. Miss Jean Gunn has replaced Miss Mary Lyon in charge of nursing service in the Institute of Ophthalmology. Mrs. Janet Monroe has been appointed to a new position created in nursing to study the use of the computer in patient care.

Four students are completing the second year of the graduate program in psychiatric-community mental health nursing and four students have started the first year of this program.

A class of ten students, the largest in our history, completed the graduate program in maternity nursing in 1968 and received a master of science degree and a certificate of nurse-midwifery from Columbia University. The faculty of this program have given considerable time this year to exploring with the medical and nursing staff what the role of the nurse-midwife should be in the hospital setting and the development of plans for an internship program in nurse-midwifery.

The first class to complete the revised four year curriculum in the baccalaureate program in nursing graduated in 1968. There were 101 students in this class. The last class to complete the five year program also graduated this year and included 62 students. The Margaret Eliot Prize for professional competence, leadership, and compassion for patients was awarded to Barbara J. Petersen in the five year program and to Lynn A. Barber in the four year program. The Sigma Theta Tau medals, given to members of the graduating class who best exemplify the principles of the honor society and the high ideals of the nursing profession, were awarded to Elizabeth K. Esser and Sandra L. Freeberg. The Arlene Myers Award was presented to Mary A. Krawec as the member of the graduating class who best demonstrated "professional competence and a sincere interest in maternity nursing."

Multiple changes are still taking place in the undergraduate program as a result of the overall curriculum revision. Theoretical courses in the basic sciences have been strengthened and, in addition, interdisciplinary seminars have been incorporated in the following courses: maternity nursing, acute nursing, long term illness, and advanced nursing.

In addition to the Washington Heights, Lower West Side, and Mott Haven Centers of the Visiting Nurse Service of New York, public health instruction and experience has been offered this year in the Eastchester Public Health Nursing Organization, a district of the Westchester County Health Department and a combined nursing agency. This is the first time that students have had clinical experience in a combined agency and in an agency outside the City of New York.

The school of nursing was approved by the National League for Nursing for admission of registered nurses to the baccalaureate program in nursing.

An application for a grant to aid in the construction of a five story addition to Maxwell Hall was approved by the United States Public Health Service. Mr. and Mrs. W. Van Alan Clark, whose original gift in 1963 provided the initial stimulus to this project, have very generously provided the additional funds needed to match the government grant. The new unit will provide new faculty offices for modern methods of teaching. When it is completed, it will be possible to increase enrollment by a considerable number of students.

The Student Scholarship Fund Benefit Bridge Committee is made up of mothers of students, alumnae of the school, doctors' wives, and friends

of the school. As a result of much hard work they again raised \$12,000 this year for scholarship assistance. Other sources of scholarship assistance include The Hartford Foundation, the Edna McConnell Clark Foundation, and the Alumnae Association of the school.

Friends and associates of Miss Gill established the Elizabeth S. Gill Gift Loan Fund for nursing students. Traineeship support for registered nurse students in the baccalaureate program has also been made available through a grant from the United States Public Health Service.

Eighteen students were admitted in the first course to be offered by the Columbia-Presbyterian School of Practical Nursing. The program was approved for commencement on September 1, 1968 by the State Education Department of the University of the State of New York. Six of the present class are former employees of the Presbyterian Hospital. Twenty-one out of sixty who took the National League for Nursing preadmission and classification examinations were accepted. Six of those accepted will be enrolling in the next class which begins in May. A very generous grant has been received from The Hartford Foundation for scholarship assistance, equipment, development of classroom facilities, and recruitment.

Other areas besides maternity have been experimenting with the role of the clinical nursing specialist in patient care. In Babies Hospital, Miss Penelope Buschman was assigned from the nursing staff to act as a clinical specialist in nursing in child psychology. The goal of reorganization of the nursing service of the Neurological Institute is the upgrading of nursing practice to provide better patient care and increase job satisfaction of the nursing staff. Two nurses, Miss Suzanne Wehrmaker and Miss Dorothy Demkovich, have been appointed as clinical supervisors.

Approximately 400 registered nurses and 50 licensed practical nurses have been oriented to the Presbyterian Hospital nursing service over the past year by the staff development personnel. This orientation program includes twenty-one hours of instruction. An intensive six weeks' course of theory and supervised clinical practice has also been offered to approximately 90 nursing aides and attendants. A new plan of orienting nursing personnel is now being developed as a pilot study on the fifth floor of the Neurological Institute.

The Exchange-Visitor Program for graduate nurses had participants from Australia, Austria, Denmark, England, India, Iran, Ireland, Japan,

Korea, Netherlands, Norway, Philippines, Switzerland, and Taiwan. The impact of the program has been out of proportion to the number of participants because of their ability to give excellent quality nursing care. There is great interest in extending the length of this program to eighteen months or two years. The program has had invaluable consultative assistance from the Department of Community Mental Health.

Miss Ann Earle, as part of the requirements of her Ph.D. degree, is completing a study of the effects of supplementary kinesthetic stimulation upon the behavioral development of the female neonate. Miss Mary Crawford received her Ed.D. degree in June, 1968. Her study concerned the physiological and behavioral cues to disturbances in childbirth.

Miss Constance Cleary has been holding workshops throughout the year with the supervisory staff and the faculty in medicine and surgery to consider and develop patterns of supervision of patient care as well as means by which nursing education and nursing service can work more closely together in improving the nursing care given to patients.

Miss Susan Maines has been actively participating in a study of audiovisual and computer assisted teaching media, their use in nursing and other health fields, and the organization of equipment for effective utilization within the medical center. The film, "Robin, Peter and Daryl" "Three to the Hospital," developed under a grant from the National Institute of Mental Health is now completed. Miss Sarah Sheets and Miss Sarah Waldkoetter, with the help of Mrs. Sylvia Hunter, Mrs. Lois Alksne, and Dr. Frank Jewitt have previewed this film for faculties of nursing, student nurses, and nursing service personnel in many different areas of the country. It will be ready for distribution by the Columbia Mass Communication Center early in 1969.

Miss Priscilla Parke participated in a panel discussion on the advantages and disadvantages of intensive care as currently practiced, sponsored by the New York State Nurses Association in Syracuse, New York and repeated in New York City. Miss Mary Crawford presented a paper on the physiological and behavioral cues to disturbances in childbirth at the annual meeting of the American College of Nurse-Midwifery in New York City and at the annual meeting of the American Nurses Association in Dallas, Texas. She also spoke on current trends

in maternity care at a program for supervisory personnel at The Johns Hopkins Hospital and participated in an interdisciplinary seminar in Princeton, New Jersey on the family and maternity care in the future sponsored by Maternity Center Association. Miss Ann Earle served as consultant at a three day conference on Community Mental Health Planning.

Faculty and staff have actively participated in the work of many professional organizations. Miss Phyllis Leppert served again this year as editor of The Bulletin of the American College of Nurse-Midwifery and on the professional advisory board for the Childbirth Education Association of New Jersey. She is also listed for the first time this year in Who's Who in American Women. Miss Martha Haber is a consultant on the ad hoc committee on grants in nursing for the National Institute of Neurological Diseases and Blindness. Miss Constance Cleary is consultant for the American Public Health Association. Miss Helen Pettit is on the advisory council on professional education of the New York Heart Association. Miss Lucy Kennedy and Mrs. Darline Bacon are members of the advisory council for the comprehensive health services project associated with Knickerbocker Hospital. Miss Dorothy Reilly acted as curriculum consultant during the past year for the faculty of the Harlem Hospital School of Nursing. Miss Ann Earle has been acting as psychiatric nursing consultant to Montefiore Hospital. Miss Cynthia White is chairman of the New York Metropolitan Committee of Inservice Directors and Miss Mary Windrow is on the board of directors of Nurses' House. Miss Mary Crawford is chairman of the Committee on Standards, Division of Maternal and Child Health Nursing Practice of the American Nurses Association. She is also serving as chairman of the Legislative Committee and as accreditation visitor for the American College of Nurse-Midwifery. Other members of the faculty and staff serving on committees of the American Nurses Association are: Miss Nora Maliepaard, Committee on Legislation; Miss Cynthia White, District Membership Committee; and Miss Nancy Oyler, District Program Committee. Miss Dorothy Robinson served as chairman of the Membership Committee of the American College of Nurse-Midwifery and Miss Bernice Derby is a member of this committee.

Obstetrics and Gynecology

CHARLES M. STEER

Acting Chairman of the Department and Acting Director of the Service

The clinical activities, research programs, and teaching activities of the service continue in much the same way as in recent years. The new laboratories on the 16th floor came into effective operation, although remodeling is not completed.

Staff Changes

Dr. J. George Moore resigned as Chairman of the Department to return to the University of California at Los Angeles as Chairman of the Department of Obstetrics and Gynecology. Dr. Charles M. Steer was named Acting Chairman. Dr. John J. Sciarra left the department to become Professor and Chairman of the Department of Obstetrics and Gynecology at the Medical School of the University of Minnesota in Minneapolis. Dr. Robert Neuwirth became Director of the Obstetrical and Gynecological Service at the Bronx Lebanon Hospital Center. Dr. John L. Lewis became Chief of Gynecology at the Memorial Hospital. Dr. Raymond Vande Wiele was promoted to Professor and Attending Obstetrician and Gynecologist and Dr. C. Paul O'Connell to Clinical Professor and Attending Obstetrician and Gynecologist. Dr. Solan Chao joined the department as Instructor and Assistant Obstetrician and Gynecologist. Dr. Albert Plentl died after a long illness.

Postdoctoral Fellowship Program

The two United States Public Training Fellowship Programs continue to be highly successful. There are now four members in the reproductive physi-

ology program and three fellows in the biochemistry and endocrinology program.

Affiliated Hospitals

The teaching program in the affiliated hospital services at Harlem Hospital, Woman's Division of St. Luke's Hospital, and the Francis Delafield Hospital continue to be of value. The affiliation with the Mt. Sinai Hospital ended because of the formation of the Mt. Sinai Medical School. A new affiliation for teaching of fourth year medical students was begun with Roosevelt Hospital.

The Teaching Committee, under the direction of Dr. Equinn Munnell, has continued to supervise the teaching activities of the department. In addition, a good deal of time and thought have been expended on consideration of the new curriculum in the medical school.

The department held its eighth postgraduate course which was attended by 170 doctors.

Patient Care

Two important changes in patient care have occurred during the past year. The prevention of Rh sensitization by the use of Rho GAM has come into regular use in our service and throughout the country. Much of the credit for this innovation is due to Dr. Vincent Freda of the Department of Obstetrics and Gynecology and to Dr. John Gorman, Director of the Blood Bank. The second change is the greatly increased use of fetal monitoring techniques in the labor room. Use of the fetal

electrocardiogram and the repeated estimations of fetal blood chemistry through scalp sampling have been greatly extended.

Research

Cytogenetics

The laboratory under the direction of Dr. Orlando J. Miller has continued its studies of human chromosomal abnormalities and their causes. With Drs. Dorothy Warburton, Dorothy A. Miller, Penelope Allderdice, Adriana de Capoa and W. Roy Breg (Yale), Dr. Miller has investigated partial deletions of chromosomes 4 and 5, which are frequently the result of a parental balanced translocation. Drs. Warburton and D. A. Miller have worked out a method of detecting very small deletions and have completed a study of the size of short arm deletions of chromosome 4 and 5. Drs. O. J. Miller and D. A. Miller, A. de Capoa and D. Warburton have demonstrated the existence of asynchronous DNA synthesis (and associated differences in length) between homologous autosomes and are investigating its functional significance. Dr. Alderdice and other members of the group, in collaboration with Dr. Harold P. Klinger (Einstein) and Dr. Jessica Davis (Einstein) have clarified the identification and clinical effects of a partial deletion of chromosome 13. Drs. O. J. Miller, Eduardo Castilla (Southbury), W. R. Breg and Theodore Kushnick (New Jersey College of Medicine and Dentistry) have delineated a new deletion syndrome involving chromosome 2. Drs. Allderdice and O. J. Miller have collaborated with Dr. Edward T. Gendel (Metropolitan Hospital) in a study of what may be a new trisomy syndrome.

Drs. Warburton and O. J. Miller have continued their studies on the control of sex chromatin.

Reproductive Biochemistry

The laboratory under the direction of Dr. Seymour Lieberman continues its studies of the biochemistry and metabolism of the steroid hormones.

Dr. Paula Zimmering is continuing her studies on the purification and properties of the specific uterine receptor protein for estradiol, with particular emphasis on its binding characteristics to estrogens and related steroids. In conjunction with Dr. Wiley Hembree, Dr. Zimmering is also initiating a program for the preparation of tritiated protein hormones using procedures that will result in random labeling. Dr. Richard Hochberg and Dr. Shoshana Ladany have been studying the biosynthesis of cholesterol sulfate. Dr. Hochberg and Mr. Theodore Vandc

Hoeven are also investigating the heterogeneity of adrenal mitochondria. The identity of the mitochondria and of the zones from which they originate are being studied with the electron microscope in collaboration with Dr. Sara A. Luse (Anatomy).

Dr. Harald Mickan has prepared single cell suspensions by treatment of cow corpus luteum with enzymes, chelating agents and by mechanical means. Attempts to separate mitochondria and microsomes from bovine corpora lutea by density gradient centrifugation are also being made. Dr. Kenneth Roberts has been investigating the nature and concentration of the hydroxylated sterol intermediates between cholesterol and pregnenolone. Further studies with Mrs. Violet Lippman on the distribution of blood-borne cholesterol sulfate have revealed that this sterol conjugate is associated with the human erythrocyte in even greater amounts than that found in the plasma.

Dr. Ross Dixon has studied metabolism of orally administered cortisol in order to determine the fraction of this corticosteroid which reaches the peripheral circulation. He, also, in collaboration with Dr. Erlio Gurpide, has been studying the significance of dehydroisoandrosterone sulfate as a precursor of 16 α -dehydroisoandrosterone sulfate and of estrogens in pregnant women. Dr. Erlio Gurpide and Miss Margaret Welch are studying the dynamics of the uptake of estrogens and androgens by target tissues. Dr. Jonah Mann and Dr. Gurpide continue their theoretical analysis of tracer experiments particularly in reference to the interpretation of curves of disappearance from blood of a tracer injected intravenously. By means of *in situ* perfusion of boar testis with radioactive cholesterol and radioactive cholesterol sulfate, Dr. Elenora P. Giorgi has determined that blood-borne cholesterol sulfate is not a quantitatively significant precursor of steroid in this tissue. She also has been studying the rate of transfer of estrogens and other steroids across the wall of Graafian follicles using techniques devised by Dr. Gurpide.

Endocrinology and Fertility

Dr. Raymond Vande Wiele and members of the Division of Clinical Endocrinology have continued studies that were begun in previous years; in addition, several new projects have been started. As the Division is growing, an effort is made to diversify in respect to the fields of interest as to all techniques of investigation, in order to encompass an increasingly broad spectrum of reproductive biology and medicine.

A collaborative study with Dr. Armand Dil Part

Assistant Professor of Mechanical Engineering, Mr. Robert J. Bogumil, a graduate student in the School of Engineering and Applied Science (Committee on Bio-Engineering) and Dr. Erlio Gurgide has been continued. The purpose of the study is to apply the principles of control theory to the problem of the menstrual cycle.

A sub-unit for the study of neuroendocrine problems of reproduction has been set up. This group, under the direction of Dr. Peter Carmel (Neurological Surgery), has started to apply to the rhesus monkey neuroendocrine techniques which have been worked out in smaller laboratory animals. Methods for the determination of blood steroids and gonadotropins in the rhesus monkey are being developed by Dr. Raphael Jewelewicz. Dr. Tawfik Rizkallah and Dr. Gurgide have completed a study of the metabolism of HCG in normal men and women. Dr. Rizkallah has also completed a study of gonadotropin levels in patients in which an attempt was made to destroy the pituitary by ultrasound. Dr. Michel Ferin has continued and considerably expanded his studies with steroid-antibodies. Dr. Antonio Tempone, Visiting Fellow from the University of Buenos Aires, Argentina, has studied the role of estrogens in implantation.

Dr. Tibor Engel and Dr. Andrew Frantz have studied the secretion of growth hormone in patients with amenorrhea due to a deficiency in gonadotropic secretion.

Dr. Michelle Warren has completed a study of the clinical effects of CL-868. In animal experiments, this synthetic substance has effects very similar to those of Clomid, a substance now widely used for induction of ovulation in the human.

Dr. Alexander Levay (Psychiatry), has started a study of sexual function and sexual identification in patients with various endocrine abnormalities. As in previous years, the steroid laboratories have been under the direction of Dr. Inge Dyrenfurth. Methods to determine LH and FSH by radioimmunoassay method are now routine in the laboratory.

A study of the synthesis and transfer of hormones in the pregnant animal is being carried out in collaboration with members of the Department of Anesthesiology.

Physiology and Abnormalities of Pregnancy

Dr. Solan Chao and Dr. Samuel Topal are preparing a review of thyrotoxicosis in pregnancy, including the experience of the Sloane Hospital. Dr. Chao in conjunction with Dr. Raphael Boulanger and Dr. Richard Rivlin (Medicine) are investigating plasma tyrosine as a thyroid function test in preg-

nancy. Dr. Chao and Dr. Samuel Topal are completing a study in the measurement of fetal weights in utero. Dr. Chao and Dr. Philip M. Johnson (Radiology), are investigating the use of Indium for placental scanning, including the transfer of Indium across the placenta.

Dr. Ezra Davidson and Dr. Ganson Purcell have undertaken a study of fibrinolysis and fibrinolytic activator systems in the endometrium and myometrium of parturient and postpartum uteri.

Fetus and the Newborn

The clinical trial of Kholmmune globulin (RhoGAM) in Rh negative mothers at risk is being continued by Dr. Vincent Freda and Dr. John Gorman. Since June 10, 1968, when Rholmmune globulin (RhoGAM) became commercially available, no new mothers have been admitted to the trial. All Rh negative mothers at risk are routinely processed for Rholmmune globulin. Rh negative mothers delivering an Rh positive baby, live or still-born, irrespective of ABO grouping and all Rh negative mothers who abort, unless the husband is known to be Rh negative, are now protected with Rholmmune globulin.

Dr. Vincent Freda and Dr. Edward Bowe have continued the salvage of affected babies through use of the Liley closed transabdominal method of intrauterine transfusion.

Dr. Karlis Adamsons, in collaboration with Drs. Stanley James (Pediatrics), Mieczyslaw Finster (Anesthesiology), Allen Hyman (Anesthesiology), Salha Daniel (Anesthesiology), Dr. Edward Bowe and Dr. Ann Milic, has continued to examine the factors responsible for the maintenance of the acid-base status of the fetus and tolerance to intrauterine asphyxia. In collaboration with Drs. Hisayo Morishima (Anesthesiology), Kotaro Suzuki, Terusada Horiguchi and Arsenio Comas, studies have continued to elucidate the effect of nicotine upon the fetus and the mother of the rhesus monkey. In collaboration with Dr. James Perel (Biochemistry), work is in progress to quantitate the transmittance of nicotine from mother to fetus. The same group of investigators have also examined the effect of ethyl alcohol upon spontaneously occurring and oxytocin induced uterine contractions, paying particular attention to the cardiovascular effect on the fetus. Drs. Comas, Horiguchi and Suzuki are conducting a study of sexual behavior of the male rhesus monkey. They are also examining the relationship between changes in body temperature of the female monkey in relationship to different phases of the menstrual cycle. Drs. Horiguchi and Suzuki

have completed a study concerned with the role of fetal swallowing in the regulation of volume of amniotic fluid in the fetal rabbit.

Dr. Bowe has completed a study of maternal fetal acid-base relationship during labor assessing the overall validity of the fetal blood sampling technique and the incidence of sampling errors inherent in this method of fetal monitoring. With Drs. Freda and Adamsons, Dr. Bowe has reviewed the experience of Sloane Hospital with intrauterine transfusions of the erythroblastotic fetus. A study has been initiated concerned with the concentration of magnesium levels in maternal and fetal blood during labor following treatment of mothers with magnesium sulphate. Observations are extended on the relationship between various solute concentrations in amniotic fluid and the gestational age of the fetus.

In collaboration with Dr. Ronald E. Myers, Director of the Laboratory for Perinatal Physiology NINDB, San Juan, Puerto Rico, and with Dr. James Miller, Professor of Anatomy, Tulane University, a study was completed to determine the effects of rapid correction of neonatal acidosis and rapid cooling upon the recovery of body functions and upon morphologic changes in the central nervous system of the newborn rhesus monkey.

Drs. Michael Levi, Ines Mandl, and Mr. John Manahan have continued their study of a fetolytic agent from aqueous hops extract. The material appears to be identical with the active ingredient of Malucidin which was believed to be a yeast by-product. The hops extract was shown to cause lysis of the fetus and complete resorption when injected I.V. into pregnant mice on any day throughout the three week gestational period. Some purified fractions had the same effect.

Drs. Mandl and Carlton Blackwood, and Mrs. Yvonne Hosannah have continued their investigation of the developmental progression of proteolytic enzymes and their inhibitors in pregnant rats.

Dr. Bowe with Dr. Thomas McCann is studying the usefulness of three components in amniotic fluid as an aid to determination of fetal gestational age. Other components of amniotic fluid are being investigated with Dr. Daniel and Dr. Richard Levine. With Dr. Finster, a film demonstrating fetal blood sampling technique was made. Under the auspices of the Network for Continuing Medical Education, two films on the subject of the management and prophylaxis of Rh disease were completed.

Neoplastic Disease

Members of the Division of Obstetrical and Gynecological Pathology under the direction of Dr.

Ralph Richart have continued their investigations of early cervical neoplasia and other presumed precursor lesions in the female genital tract. Dr. Richart in collaboration with Dr. Bruce A. Barron of the Rockefeller University has prepared a statistical model of the natural history of cervical dysplasia based on a longitudinal study of 557 women. Dr. Takashi Okagaki and Dr. Richart have designed and constructed a miniature oxygen electrode system and chamber through which it is possible to measure accurately oxygen consumption in diploid cell strains grown on glass as a monolayer. In a collaborative study, Drs. Arline Deitch (Microbiology), Dieter Wagner and Richart studied staining conditions influencing the intensity of the Fuelgen reaction, a histochemical stain used in quantitative estimation of nuclear DNA content. In another collaborative project Dr. Rafael Weiss (Einstein), in association with Dr. Richart and Dr. Okagaki, studied the nuclear DNA content of mucinous tumors of the ovary of the so-called borderline type.

Dr. Mary Parshley studied growth inhibitors extracted from normal beef tendon by tryptic digestion. Dr. Parshley, with Dr. Blackwood and Dr. Mandl, studied the effect of these inhibitors in animals. Miss Claire Ziegelmaier is studying the effect of the inhibitors on cell metabolism. Mrs. Julia Einbinder is studying the relative cohesiveness of treated cells of different grades of malignancy. Drs. Michael Levi and Mary Parshley have investigated the antigenicity of two established lines of human cancer cells by successive inoculation of sound treated cells into rabbits. A comparison between cell cultures of normal and malignant respiratory epithelium has been studied by Miss Claire Ziegelmaier. Dr. Braz Martorelli, Jr., has studied the effect of chemotherapeutic agents on human breast and ovarian cancer cells in tissue cultures.

Drs. Michael Levi and Ines Mandl have continued their studies of the antigenic components of papillary cystadenocarcinoma. Experiments designed to correlate *in vivo* and *in vitro* inhibition of tumor growth by connective tissue extracts were continued. Drs. Blackwood, Parshley and Mandl investigated the regression of a Flexner Jobling rat tumor after injections with a methanol precipitate of the extract.

Clinical Studies

In a collaborative study, Dr. Henry Vaillant of the Harvard School of Public Health, Dr. G. T. M. Cummins of the Queen Elizabeth Hospital, Bridgetown, Barbados, Dr. Richart and Dr. Barron undertook a comparative study of intrauterine contracep-

tive devices inserted under field conditions. In another collaborative study, Drs. Vaillant, Cummins and Richart developed an island-wide cervical cancer screening program in Barbados, West Indies, utilizing paramedical personnel and existing health facilities. Among the first 5,000 women screened .5 per cent had invasive carcinoma, .8 per cent carcinoma-in-situ, and 4.2 per cent dysplasia. This high pickup rate suggests that directing a screening program at those women who are undergoing a reproductive event is an efficient, effective and relatively inexpensive method of detecting cervical neoplasia.

Dr. Robert E. Hall, working closely with the International Institute for the Study of Human Reproduction, has continued his study of birth control methods prescribed to the postpartum patients. With the help of Dr. Susan Williamson, he has continued the follow-up of 4,000 IUD wearers who were originally fitted with devices between 1963 and 1966.

Drs. Ganson Purcell and Ezra Davidson have studied the efficacy of heparin therapy in the management of septic abortion, specifically regarding correction of overt coagulopathies and prophylaxis against pulmonary emboli attendant to severe pelvic infection. They are also attempting to refine coagulation resultant from infection.

Dr. H. Clay Frick, in collaboration with Dr. George Hyman (Medicine) continues to evaluate various chemotherapeutic agents in the treatment of advanced ovarian cancer. Dr. Frick and Dr. Hyman are evaluating a combination of chemotherapeutic drugs in the management of widely disseminated ovarian cancer which has failed to respond to surgery, radiotherapy and an alkylating agent. The drugs being used at present are vincristine, amethopterin (Methotrexate), actinomycin D., and phenylalanine mustard (Alkeran).

Dr. Frick and Dr. Raymond McCaffrey are continuing to review the results and complications of radical hysterectomy.

Dr. Frick is preparing the tables showing results of Cancer of the Cervix and Vagina for inclusion in Volume 15 of the Annual Report on the Results of the Treatment of Carcinoma of the Uterus and Vagina (Stockholm) which is published under the patronage of the International Federation of Gynecology and Obstetrics.

Dr. Wolfgang Tretter, together with Drs. Frick, Patricia Tretter and George Hyman, completed an investigation of the effects of Alkeran on disseminated ovarian carcinoma. Dr. Wolfgang Tretter continues the clinical investigation of patients with

pelvic floor relaxation and methods of operation for this disorder. Dr. Equinn Munnell continues his studies on ovarian carcinoma. Dr. Charles Steer and Dr. J. George Moore completed a study of perinatal mortality covering the entire history of the Sloane Hospital for Women. Dr. Steer completed a study on maternal mortality since the opening of the Hospital. Dr. Steer completed a study of the clinical factors associated with a low Apgar Score in newborn babies.

Clinical Report

During the year 1968 the number of Clinic visits again rose slightly (Table 1). This rise occurred in both the obstetrical and gynecological clinics.

The total number of deliveries has diminished somewhat (Table II). This was the result of a distinct drop in private deliveries although there was an increase in the number of ward deliveries.

The perinatal mortality (Table III) fell during 1968 to an all time low for this Hospital. The low rate of 15.6/M on the Ward Service was achieved once before, in 1953. The low rate of 18.5/M on the Private Service has been achieved on a number of occasions going back to 1944. This is the first year, however, in which both Services reached such low levels. It is again noteworthy that the perinatal mortality rate on the Private and Semi-Private Service exceeds that on the Ward Service for the third consecutive year. This is due entirely to the large number of patients with erythroblastotic problems referred to the staff because of the special attention given to this problem at this Hospital. The perinatal mortality for term size infants continues to be impressively low. The perinatal mortality rate (Table IV) in infants of less than term size remains at about the same level year to year.

The number of operative deliveries performed during the year remains essentially unchanged (Table V). The number of gynecological operations performed has risen somewhat from the level of the last two years (Table VI). The decrease in number of patients operated upon on the Ward Service, which became apparent in 1966, has been reversed to some extent, but has not reached previous levels. This is undoubtedly due to the effect of the Medicaid and Medicare programs.

The number of cancer patients followed in the Tumor Clinic remains at a very high level (Table VII). This program requires a considerable staff and a great deal of effort but is absolutely necessary in order to determine properly the effectiveness of treatment.

In Table VIII the results of treatment of gynecological cancer are given. It appears that those patients treated in 1962 did especially well in the

group with cancer of the corpus of the uterus, but the others remain essentially unchanged.

TABLE 1
CLINIC VISITS

	<i>1964</i>	<i>1965</i>	<i>1966</i>	<i>1967</i>	<i>1968</i>
Obstetrical	30,168	27,026	25,383	25,863	26,041
Gynecological	19,142	21,219	19,276	20,309	21,398
Total	49,310	48,245	44,659	46,172	47,439

TABLE 2
VIABLE DELIVERIES

	<i>1955-1964</i> <i>Average</i>	<i>1965</i>	<i>1966</i>	<i>1967</i>	<i>1968</i>
Ward	2,946	3,139	3,093	3,082	3,145
Semi-Private	771	662	672	658	631
Private	714	655	642	655	616
Total	4,431	4,456	4,407	4,395	4,392

TABLE 3
PERINATAL MORTALITY

	<i>1955-1964</i> <i>Average</i>	<i>1965</i>	<i>1966</i>	<i>1967</i>	<i>1968</i>
Ward	25.8/M	20.6/M	20.2/M	23.0/M	15.6/M
Private and Semi-Private	17.9/M	20.3/M	22.8/M	24.3/M	18.5/M

M — per thousand *viable births* (more than 1000 grams)

TABLE 4
RELATION OF BIRTH WEIGHT TO PERINATAL MORTALITY

<i>Weight in Grams</i>	<i>Total Births</i>	<i>Total Perinatal Deaths</i>	<i>1967 Per Cent Perinatal Mortality</i>
500 - 1,000	50	47	94.0
1,000 - 1,500	37	23	62.0
1,500 - 2,000	93	18	19.4
2,000 - 2,500	254	11	4.3
Over - 2,500	3,993	20	0.5
Total	4,427	119	2.7

TABLE 5
OPERATIVE DELIVERIES

	<i>Ward</i>	<i>Private & Semi-Private</i>	<i>Total</i>
Cesarean Sections	247 (7.9%)	139 (11.1%)	386 (8.8%)
Primary	139	70	209
Repeat	108	69	177
Mid Forceps	107	70	177 (4.0%)
Low Forceps	677	432	1,109 (25.4%)
Breech Deliveries	87	28	115

TABLE 6
GYNECOLOGIC OPERATIONS

	<i>1955-1964</i>	<i>Average</i>	<i>1965</i>	<i>1966</i>	<i>1967</i>	<i>1968</i>
Ward		915	974	734	750	810
Semi-Private		576	550	578	605	565
Private		453	487	408	429	500
Total		1,926	2,011	1,720	1,784	1,875

TABLE 7
CASES OF GYNECOLOGIC CANCER TREATED OR UNDER OBSERVATION
DURING EACH OF YEARS FROM 1957-1968

	<i>Total Patients Followed</i>	<i>The Presbyterian Ward</i>	<i>The Private</i>	<i>The Francis Delafield</i>
1957	1,950	850	696	404
1958	1,883	853	612	418
1959	1,945	920	618	407
1960	2,248	1,084	696	468
1961	2,384	1,180	732	472
1962	2,601	1,319	801	481
1963	2,851	1,527	783	541
1964	3,198	1,752	852	594
1965	3,633	2,015	930	688
1966	3,581	2,282	850	449
1967	3,577	2,301	901	375
1968	2,396	1,281	742	373

TABLE 8
FIVE YEAR RESULTS IN PRIMARY CASES OF GYNECOLOGIC CANCER
TREATED AT THE PRESBYTERIAN HOSPITAL, 1954-1962

	<i>1954 through 1961 inclusive</i>			<i>1962</i>		
	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>
Cancer of Cervix Uteri						
Stage I	209	156	75%	16	10	63%
Stage II	154	77	50%	14	7	50%
Stage III	51	16	31%	6	3	50%
Stage IV	23	0	0%	1	0	0%
Total of all Cases	437	249	57%	37	20	54%
Cancer of Corpus						
Cancer of Ovary	357	208	58%	31	11	35%
Cancer of Ovary	272	93	34%	49	36	73%

Ophthalmology

A. GERARD DEVOE

Harkness Professor and Chairman of the Department • Director of Service

In spite of the physical problems associated with the construction of the new research and clinic wing to the Eye Institute during the year 1968, our activities and accomplishments closely parallel those of the previous year.

Staff Changes

Dr. Maynard C. Wheeler, devoted alumnus of the Eye Institute and a pillar of strength since its foundation, retired during the year but has continued to be active in resident teaching programs, an area in which his skill and patience have been most appreciated by several generations of residents.

Another most faithful member of the staff since its inception, Dr. Deborah Locatcher Khorazo, retired this year. Her industry and long hours of work have been proverbial. They will no doubt continue during her retirement as she proceeds with the writing of her book on *Microbiology of the Eye*.

Our research department has suffered two major losses. Dr. Saiichi Mishima resigned to take a teaching post in his homeland, Japan, and Dr. Albert Ketler's tragic death at the age of 40 has terminated a most productive program in virology of ocular diseases. Neither of these two men will be easily replaced. We regret also the retirement of Miss Elizabeth Culbert, faithful custodian of the John M. Wheeler Library.

We welcome to the department Drs. Gabriele Ehrlich, R. Linsky Farris, Frank Hoefle, Milton Kaplan and Richard J. Kossmann, each of whom

brings talents in clinical and investigative ophthalmology.

Teaching

Teaching efforts remain largely at the postgraduate level. At the recent meeting of the American Academy of Ophthalmology and Otolaryngology which presents the largest formal postgraduate instruction program in the country, twenty-eight members of our staff took part in twenty-two instructional programs, the largest contribution of any eye department in the country.

Statistics

In 1968 4,029 patients were hospitalized for 29,055 patient days as compared to 3,869 patients and 29,247 patient days recorded during the previous year. 3,874 operative procedures were performed in our operating rooms, an increase of 18% over 1967. In the Vanderbilt Clinic 26,510 patient visits included 2,713 visits to the Children's Eye Clinic, which continues under the able direction of Dr. Philip Knapp and Miss Sally Moore, supported in part by the National Council to Combat Blindness, Inc. 2,179 patient visits were recorded in this unit. In the Eye Pathology Laboratory, directed by Dr. George M. Howard, 541 specimens were processed. With the retirement of Dr. Khorazo, Dr. Edward Wirostko has assumed the directorship of the Microbiology and Clinical Pathology Diagnostic Laboratories of the Eye Institute. 4,690 examinations were

carried out. Supervised by Dr. Stephen Trokel, who has established a close collaboration with the neuro-radiological group, the X-ray Department in the Eye Institute has shown a marked increase in activity. The John M. Wheeler Library now contains 8,284 bound volumes, maintaining its position as one of the outstanding eye libraries in the world. Visitors from seventeen different countries visited during the year. Its specialized function has drawn requests for books, periodicals or information from universities all over the country. This library is one of the major strengths of the Eye Department.

Research

In addition to carrying the heavy administrative responsibility of organizing the department's research activities, Dr. George Smelser has taken part in or guided a number of specific programs which include eight postdoctoral fellows and three predoc-toral fellows.

Dr. Irwin Beitch, having developed an experimental model for the study of dry eyes in animals, is investigating the pathology of corneal epithelium. Dr. Jiri Obenberger, completing his work on calcification of the cornea, has returned to his home university in Prague. Dr. David Ocumphaugh has completed his study of experimental pathology of the cornea, with particular reference to calcium as demonstrated by histochemical analysis. Dr. Hiro-yuki Shimizu has determined quantitatively the sodium-potassium activated ATPase in pigmented and non-pigmented epithelial cells of bovine ciliary processes. This enzyme plays a primary role in aqueous humor secretion. With Drs. Hajime Inomata and Anders Bill, a study to determine the normal outflow pathways of aqueous in the Cynomolgus monkey was begun. Dr. Luc Missotten has been investigating the development of intraretinal neuronal connections in the embryonic and neonatal rabbit. Mr. Thomas Weingeist is conducting a study on the anatomy and fine structure of the ciliary body of the adult and embryonic rabbit. With Dr. Inomata, Dr. Smelser has induced experimental keratitis by the injection of bovine serum albumin into the vitreous body of rabbits with the purpose of studying the changes in the endothelium by electronmicroscopy. Collaborating with Dr. Inomata and Dr. Frank Polack, he has studied the fine structural changes in corneal graft rejection.

Dr. Wladyslaw Manski has continued his studies on immunochemical characteristics of lens albumenoid and lens crystalline. With Dr. Ehrlich and Polack he has carried on his immunochemical study on the action of anti-cornea sera in vivo and, with

Dr. Coronacion Martinez, immunochemical studies on the antigenetic composition of the cornea.

Dr. Abraham Spector's efforts, in collaboration with Dr. Carol F. Wannemacher, have been primarily directed towards further elucidation of the structure of alpha crystallin and of the pattern of protein synthesis in the lens. His group has also become involved in biochemical studies of the cornea in collaboration with Drs. Kailash Bhuyan and D. Bhuyan.

Dr. Laszlo Z. Bito has continued his project on the homeostasis of the chemical composition of the intraocular and cerebrospinal fluids. He has demonstrated that the sympathetic system does not play a role in the anti-ACh induced changes in cholinergic transmission in the iris.

Dr. Kenneth Eakins has been involved primarily with the effects of anesthetic agents on the intraocular pressure, outflow facility, and the composition of blood and aqueous humor, as well as the ocular actions of the prostaglandins in the cat and rabbit. He has demonstrated that the choice of anesthetic agent can markedly effect experiments on aqueous humor dynamics. He is testing the working hypothesis that the prostaglandins may be the chemical mediator for ocular inflammation. During his studies on cardiac arrhythmias in the anesthetized cat, he is observing characteristics of blood flow through the anterior uvea.

Dr. Paul Witkovsky's main program concerns neurophysiological signs of brightness and color perception in the carp retina. He has added electronmicroscopical techniques to the study of synaptic relations in the plexiform layers of the carp retina.

In addition to clinical investigations noted last year, Dr. Irene Loewenfeld has expanded her experiments on iris mechanics and is proceeding with her exhaustive study, a handbook on the pupil.

In the Corneal Center a fifth year of progress has been completed under the direction of Drs. Anthony Donn, DeVoe and Smelser. The significant amount of basic research accomplished in previous years is being supplemented by clinical research. Dr. Teiichi Morisue is continuing the physiological studies of corneal endothelium initiated by Dr. Saiichi Mishima who has returned to the University of Tokyo. Dr. Frantisek Vrabec, Professor of Ophthalmology at the University of Prague, is spending the current year with Dr. Smelser on anatomical studies of the cornea.

Dr. Zen-ichi Kubota completed his work on tear volume, flow and osmolarity in patients with keratoconjunctivitis in June of 1968. Dr. Frank Hoefle

is now in his second year of clinical research directed toward the physiology of human donor corneas, fresh, frozen and stored.

Dr. R. Linsky Farris has been interested in the physiology of corneal contact lenses and has extended the technique of Drs. Mishima and Kubota. Dr. Richard Darrell, with Drs. N. Ketler and Paul D. Ellner, has studied the possible role of pleuro pneumonia-like organisms in corneal disease. He is further investigating the possibility of interferon production in the rabbit.

Dr. Sotiris Liaricos completed his clinical research fellowship in June 1968, studying the use of sclera and fascia lata grafts to help in the retention of keratoprostheses.

Drs. Hernando Cardona, DeVoe and Ramon Castroviejo have continued their investigation of various types of keratoprostheses and have discussed them at several international meetings.

Prior to his tragic death Dr. Albert Ketler had discovered a new property of the herpes simplex virus infected cell: its direct adsorption of mouse erythrocytes. In the biochemical division of the Corneal Center Dr. Zacharias Dische's laboratory has continued investigations on the role of protein linked carbohydrates of the cornea.

Dr. Ethel I. Anderson has investigated factors that influence results obtainable with an in vitro system to assay leucotaxis.

Resident activity in research is encouraged; most of the men have developed a considerable amount of expert knowledge in basic areas prior to their graduation. Dr. Richard Lennon is evaluating diurnal variations of intraocular pressure in glaucoma and steroid provocative tests of the normal eye in patients with unilateral angle recession glaucoma. Dr. Stephen Sills has compared tests for abnormal retinal correspondence with particular emphasis on the striated glass test and has noted the effect of Mecholyl on third nerve lesions. Dr. Robert Jack has continued the work begun last year in electron microscopy on the development and regression of the hyaloid vascular system and on the innervation of the human corneal epithelium. Dr. Frank Grady has completed a study on electron paramagnetic resonance studies of visual pigments and ocular melanins and has taken part in a clinical trial of alkyl-2-cyanoacrylate adhesives. Dr. John McGroarty has observed the nature of the subretinal fluid and vitreous in retinal detachment.

The Knapp Memorial Laboratory of Physiological Optics, under the direction of Dr. Charles J. Campbell, has functioned as a supporting organization for the retinal clinic. Experimental evaluation of

the ocular effects of various lasers has been studied both clinically and histologically. New instruments have been designed and construction is in progress. The technique of fluorescein photography has been standardized and well established. In conjunction with Drs. Robert Ellsworth, George Howard and Harold Spalter, a variety of diseases have been treated with primary emphasis directed towards the management of retinal detachments, retinal vascular and degenerative macular syndromes, diabetic retinopathy, retinal tumors and inflammatory diseases of the posterior segment.

The Retinoblastoma Clinic, supervised by Drs. Algernon B. Reese and Robert M. Ellsworth, is the largest such clinic in the world. Attention is being directed towards the immunochemistry and immunology of cancer with particular reference to retinoblastoma.

Dr. Emil Wirostko and associates in the Uveitis Laboratory, investigating the role of auto immunity to lens protein as a cause of uveitis, have been searching the aqueous of both inflamed and normal eyes for the presence of a possible pathogenic agent. This holds considerable promise and will be reported in detail later.

In the Glaucoma Clinic, under the direction of Drs. Andrew de Roeth and Max Forbes, studies are being carried on in the use of cryosurgery, the complications of anti cholinesterase therapy, the management of traumatic glaucoma and development of additional instrumentation for goniotomy.

Dr. Robert S. Jampel in collaboration with Harkness Fellow, Dr. Peter Fells, from England, collaborated in fundamental studies on the mechanics of the ocular muscles.

Dr. George M. Howard, in addition to supervising the Ophthalmic Pathology Laboratory's activities, is a co-investigator in the role of coagulation therapy in retinal disease and in a Child Development Program studying the pathogenesis of cerebral palsy.

Dr. John W. Espy, supervising the contact lens department, has been evaluating new plastics for contact lenses.

The Department of Radiology at the Eye Institute is now working closely with that at the Neurological Institute with Dr. Stephen Trokel as liaison officer. An instrument to measure choroidal thickness in human eyes has been completed and the measurements will be begun with suitable subjects.

Dr. George R. Merriam, Jr. is currently evaluating the relative sensitivity of various age groups to radiation cataracts. He has not been able to substantiate the current feeling that young lenses are more sensitive than old lenses to cataract formation.

Drs. Frank D. Carroll and Robert M. Day continue their study of optic nerve involvement in Graves' disease. Dr. Carroll is at present studying Jamaican optic neuropathy in immigrants from the Caribbean area.

Studies in the use of ultrasound for both diagnostic and therapeutic purposes have progressed in several areas during the past year in Dr. D. Jackson Coleman's laboratory. A new hand operated B-scan system has been designed and assembled and the use of high energy focused ultrasound for therapeutic treatment of vitreous hemorrhage is being tested in animals.

Dr. Richard W. Darrell's research activities have been directed towards three general areas: a search for infectious agents in clinical infection; herpes simplex virus infection of the eye; and the importance of corneal graft antigens.

In Dr. Francis A. L'Esperance's laser laboratory work has progressed on the development of the argon laser to treat vascular disease of the eye. The operating room has been equipped with facilities to permit the use of the newly constructed argon laser for operations requiring sterile procedure.

Further work with lasers in the field of surgery is being considered.

Dr. Ira S. Jones, in collaboration with Dr. William C. Cooper, has demonstrated their interest in tumors of the eye and orbit with a prize winning exhibit which was shown at the American Medical Association meeting in San Francisco and at the American College of Surgeons meeting in Atlantic City.

Generous contributions from many individuals have made possible the undertaking of many of our research activities. In particular we are grateful to: The American Optical Company, Rev. Gordon S. Anderson, Mrs. H. P. Bush, The Robert Sterling Clark Foundation, The Marie Heye Clemens Fund, Inc., The Mary W. Harriman Fund, The John A. Hartford Foundation, Inc., The Knights Templar Foundation, Dr. Zev Kohn, The Dunlevy Milbank Foundation, The National Council to Combat Blindness, Inc., The National Foundation, Research to Prevent Blindness, Inc., The Alfred P. Sloan Foundation, Shearson, Hammill Foundation, Dr. Taras Shegedyn, The Seth Sprague Educational and Charitable Fund, Mr. J. Traphagen, The United States Public Health Service, and Dr. Agnes Wilson.

Orthopaedic Surgery

FRANK E. STINCHFIELD

Professor and Chairman of the Department · Director of Service

The retirement of Dr. Melvin B. Watkins is reported with deep regret. Dr. Watkins faithfully served The New York Orthopaedic Hospital for many years and his presence at departmental activities is deeply missed. Dr. James N. Worcester, Jr. resigned early in the year to limit his activities to practice in Connecticut and Dr. Theodore R. Waugh resigned in the fall to assume his duties as Professor and Chairman of the Department of Orthopaedic Surgery at the University of California.

Drs. Charles T. Ryder and Charles S. Neer II were promoted to Professors of Orthopaedic Surgery. Dr. Marvin L. Shelton was promoted from Associate in Orthopaedic Surgery to Assistant Professor of Clinical Orthopaedic Surgery. Dr. Rosamond Kane was appointed Instructor in Orthopaedic Surgery. Dr. Hugo A. Keim was appointed Assistant Attending Orthopaedic Surgeon and Instructor in Orthopaedic Surgery. Dr. Eric K. Zitzmann was appointed Assistant Attending Orthopaedic Surgeon, Vanderbilt Clinic, Dr. John L. Xethalis was appointed Assistant Visiting Orthopaedic Surgeon at Harlem Hospital Center and Instructor in Orthopaedic Surgery. Dr. Peter N. Carbonara was appointed Consultant in Orthopaedics at the New York State Rehabilitation Hospital and Instructor in Orthopaedic Surgery. Dr. Austin D. Johnston, assigned to the Department of Orthopaedic Surgery, was promoted to Associate Professor of Pathology. Dr. Luther M. Strayer III, Senior Annie C. Kane Fellow, was appointed Instructor in Orthopaedic Surgery.

During 1968, 3,101 patients were admitted and 2,507 operative procedures were carried out.

Classification	Number of Procedures
Back	168
Upper Extremity	899
Lower Extremity	764
Hip	420
Knee	238
Miscellaneous	18

During the past year, there were 31,497 clinic visits and 1,679 patients returned to the follow-up clinics.

The Orthopaedic Service at the Harlem Hospital Center has continued to increase its activities and is becoming more and more of a teaching setup under the direction of Dr. Shelton. During the year their program was approved for the training of three additional residents, one at each level. Rotation of residents to Harlem Hospital has continued, and combined conferences and discussions between our two groups have been mutually helpful to the staffs of both institutions.

Development of the Orthopaedic Service at the New York State Rehabilitation Hospital, under the direction of Dr. Charles T. Ryder, has been aided by expanding staffing in other specialties, especially pediatrics, internal medicine, and rehabilitation medicine. The State has prepared plans for new construction, starting with a core area for laboratories, surgical units, and other basic facilities;

hopefully, work will begin within the next two years.

Dr. Melvin B. Watkins has joined the regularly active orthopaedic staff, as have Drs. Harold M. Dick and Hugo A. Keim. Dr. Dick is focussing his attention on hand surgery; Dr. Keim on scoliosis and other spine deformities in children. Dr. Edward M. Wheeler is starting a project in the surgery of rheumatoid arthritis.

As of July 1969, all residents at The New York Orthopaedic Hospital will rotate through the Orthopaedic Service at the Rehabilitation Hospital. This is of special import because it will add approximately 85 beds to our present quota of 29 for children with orthopaedic problems, many of which are not seen here under the present setup.

A valuable step in the development of the service at the Rehabilitation Hospital is the establishment by the State of a full-time Chief of Orthopedic Surgery position. Dr. Worcester, the first appointee to this position, resigned to do private practice exclusively, and a search for a highly-qualified replacement is under way.

The thirteenth annual postgraduate course in orthopaedic surgery and pathology was attended by 154 orthopaedic surgeons from various sections of the country.

Professor J. William Hillman, Chairman of the Department of Orthopaedic Surgery at Vanderbilt University, served as Visiting Professor for the week of February 4th to 10th, 1968.

The forty-second annual meeting of the Alumni Association of The New York Orthopaedic Hospital, held on April 25th and 26th, was attended by an exceptionally large number of members and guests. The meeting on the second day was held at the New York State Rehabilitation Hospital and included the delivery of the Eleventh Annual Alan DeForest Smith Lecture by Dr. William T. Green, Harriet M. Peabody, Professor of Orthopaedic Surgery at the Harvard Medical School and Orthopaedic Surgeon-in-Chief at the Children's Hospital Medical Center in Boston.

Contributions for construction on The New York Orthopaedic Hospital Alumni Auditorium have continued, and have reached a total of \$161,676.49. The delay in starting construction of the auditorium has been occasioned by the fact that there was no available area until the Dana W. Atchley Pavilion was opened, which provided other private office space.

Under the direction of Dr. C. Andrew L. Bassett, the Orthopaedic Research Laboratories have been extremely active and productive. Mr. Charles

Helming, a third year student, is investigating methods to stimulate bone formation in animals. Mr. Roger Lenke, a member of the second year class, was successful in preparing portions of single osteones and in studying their electrical properties. Dr. Roby C. Thompson, Jr., became a senior trainee upon completion of his residency and spent the year working with Drs. Bassett and Irwin Clark (Biochemistry), on the effects of compression and immobilization on articular cartilage. Dr. Thompson's approach to the investigation included experimental surgery, histology, histochemistry, autoradiography and chemical characterization of lysosomal enzymes in cartilage and synovium. Dr. W. Dilworth Cannon, Jr., presently in his second year of orthopaedic residency, has undertaken a study of the effects of extractable osteogenic substances on bone formation *in vivo* and *in vitro*.

The clinical investigation of leg lengthening has continued during the year and to date a total of eleven tibial lengthenings have been performed. Two new apparatus, incorporating further modifications, have been developed in consultation with Mr. Rudolph Gandy and Mr. Isidore Zamosky at Columbia University and the New York State Rehabilitation Hospital, respectively. A femoral lengthening apparatus has been constructed and will be put to use in the near future. As a joint project with Dr. George VanB. Cochran, strain gauges have been incorporated in these apparatus to follow the forces required to achieve lengthening. Data accumulating from these studies indicate a significant plastic behaviour of connective tissues in the lower extremity and suggests that the rate of lengthening can be controlled more rationally.

The major emphasis of Dr. Bassett's research program continued to be focused on bioelectric phenomena in bone and other connective tissues.

In an attempt to discover whether electrical events of the magnitude and type present in bone can control cellular activity, tissue culture studies were initiated. The 3T-6 strain of fibroblasts were grown in electrostatic fields ranging from 100 to 2,000 v/cm.

The collaborative study of parathyroid physiology with Dr. Louis M. Sherwood (Medicine) has been continued. As a result, magnesium ions were shown, for the first time, to have a direct effect on the parathyroid gland *in vitro*. In the presence of low magnesium levels, parathyroid hormone production (or release) was stimulated at high levels, depressed.

During the past year, Dr. Clark has continued his investigations on the interrelations of calcium, mag-

nesium and phosphate. He had explored further the role of magnesium ions in skeletal metabolism. In collaboration with Dr. Roby C. Thompson, Jr., he has investigated the role of the lysosomal enzymes in normal and degenerating cartilage and currently is studying the lysosomal enzymes in mineralized tissue. Dr. Clark has isolated a protein from bone to which tetracycline binds and currently is trying to purify this material.

Dr. Robert E. Carroll has continued his dedicated interest in hand surgery and has made available to many foreigners as well as to visitors from the United States his teaching on the hand with congenital deformities and also on reconstruction following trauma and paralytic diseases of the hand and upper extremity. Dr. Carroll was elected an honorary founding member of the Latin American Society for the Surgery of the Hand, an honorary member of the Orthopaedic Association of Argentina, and vice-president of the Association of Bone and Joint Surgeons.

Dr. Harold M. Dick, who joined the attending staff last year, is confining practically all of his work to surgery of the hand and bone tumors.

Dr. S. Ashby Grantham has devoted most of his time to surgery of the cervical spine and of the hand and taking a very active part in the in-training examinations given to orthopaedic residents.

Dr. Austin D. Johnston has been extremely active in the teaching of pathology to the residents and in the postgraduate courses.

Dr. Charles S. Neer II has been extremely active in the past year studying fractures of the upper extremities and the clavicle. Dr. Neer was appointed as an alternate member of The American Board of Orthopaedic Surgery and as one of the three members of the Residents Committee of The American Orthopaedic Association. He continued to serve on the Credentials Committee of the American College of Surgeons.

Dr. Bassett has continued as Consultant to the Division of Medical Sciences, National Academy of Sciences, National Research Council; as Acting Executive Secretary to Committee on the Skeletal System, and as a member of the Editorial Board of Transplantation, and Calcified Tissue Research. During the year he assumed the Presidency of the Orthopaedic Research Society, was appointed Chairman of the Committee on Research and its Relation to Disease, National Health Program for Orthopaedics of the American Academy of Orthopaedic Surgeons.

Dr. George B. Ambrose has continued his primary interest in the role of orthopaedic surgery in

cerebral palsy as well as his outstanding work in wound infection. He was appointed as Consulting Editor to the Journal of Medical Cases and Comments.

Dr. Everett C. Bragg continues to work on the vascular communications from the lumbar vertebral bodies to the intervertebral discs.

Dr. Frederick S. Craig has continued his primary interest in bone biopsy, using the Craig vertebral body biopsy apparatus.

Dr. Rosamond Kane is continuing her work on chromosomal studies of families with positive history of clubfoot.

Dr. Keim is very active in the new approach to the diagnosis and treatment of scoliosis.

Dr. Sawnie R. Gaston has continued his intensive interest in the treatment of trauma. He was elected president-elect of the American Association for the Surgery of Trauma.

Dr. Harrison L. McLaughlin was the recipient of an award from the American College of Surgeons for his work as a former chairman (1959-1964) of the Committee on Trauma.

Dr. Frank E. Stinchfield was re-elected President of The American Board of Orthopaedic Surgery. In July, he lectured at the University of Athens and was guest speaker at the French-Greek Orthopaedic Society, following which he represented The American Board of Orthopaedic Surgery in a combined meeting with the British in London, England, at which time the discussion of what constitutes orthopaedic residency education was discussed in depth.

Our resident staff has remained active in research. Work on various projects is being carried out by Drs. Robert L. S. Boothe, David S. Bradford, W. Dilworth Cannon, Jr., Earl V. Fogelberg, Jack H. Henry, William R. Kennedy, Ara Y. Ketenjian, Joseph P. Leddy, Luther M. Strayer III and Joel D. Weinstein. While in training, various members of the residency staff were afforded the opportunity of attending local and national orthopedic meetings, courses and seminars outside the Medical Center.

We are especially grateful for the continued unselfish help of the Women's Auxiliary in support of The New York Orthopaedic Hospital. Their willingness at all times to be of help is a great source of satisfaction to our entire hospital. During the past year, we lost a most valuable member of our Women's Auxiliary through the death of Mrs. Robert E. Carroll who always gave so willingly of her time and energy to our hospital. A special fund known as the Harriet Birmingham Memorial Fund, to be used as a source of loans for residents, has been established and contributions

have been received from many friends and members of our Alumni Association.

The New York Orthopaedic Hospital continues to be extremely grateful to its many fine friends who so generously support our activities. These contributors include Mr. Malcolm P. Aldrich, Mr. John R. Birmingham, Mrs. Katherine C. Birmingham, Mrs. Carolyn V. Bourne, Dr. Basil J. Ellmers, Mr. John Farwell, Mrs. Anna I. Feldman, Mrs. Marie Lou Flemming, Dr. Frederick K. Heath, Mrs. Thomas Hitchcock, Jr., Mr. John W. Hornor, Mr. and Mrs. H. H. Hoyt, Jr., Miss Marion C. Kenton, Mr. Robert S. King, Mr. and Mrs. L. F. McCollum, Mr. and Mrs. George Miller, Mr. Charles S. Mun-

son, Mrs. Frances B. O'Mara, Mrs. Willis L. M. Reese, Mrs. Bernard E. Smith, Mr. Bernard E. Smith, Jr., Dr. Sanford Sternlieb, Mrs. DeWitt Wallace, Mr. and Mrs. Harold P. Wilmerding, The Proctor and Gamble Company, the United States Public Health and the Social and Rehabilitation Services of the Department of Health, Education and Welfare, the E. R. Squibb Institute for Medical Research, the Health Research Council of the City of New York, the National Institutes of Health, the Orthopaedic Education Foundation, United Hospital Fund of New York, Williams-Adler Foundation and the Atomic Energy Commission.

Otolaryngology

DANIEL C. BAKER, JR.

Professor and Chairman of the Department • Director of Service

During the past year there were two deaths on the service, Dr. Franz Altmann and Dr. James Babcock.

Dr. Franz Altmann was an internationally known authority of ambriology and histopathology of the ear. Dr. Altmann came to the College of Physicians and Surgeons in 1938 from the University of Vienna. He retired from the position of Clinical Professor of Otolaryngology and Attending Otolaryngologist in July 1966. Following his retirement he remained active in the medical school and was conducting research work on otosclerosis. Dr. Altmann was a scholar and a gentleman of the old school. His loss is keenly felt by the department.

Dr. James Babcock, a Consultant in Otolaryngology, who retired in 1953 was Chief of the Otolaryngology Clinic in Vanderbilt Clinic for many years. He also served as Clinical Professor of Otolaryngology and Attending Otolaryngologist. He will always be remembered as a very kindly gentleman, who was an excellent clinician.

The retirement of Mrs. Shulamith Kastein took place on March 1, 1968. She gave a very long and devoted service to our Hearing and Speech Clinic. She made outstanding contributions in the field of language development. She will continue to furnish her special talents to the department. She has been appointed as Special Lecturer in Otolaryngology.

Dr. Jules G. Waltner was promoted to Professor of Clinical Otolaryngology. Dr. Malcolm Schvey was promoted to Assistant Clinical Professor of Otolaryngology. Dr. John S. Lewis, the Director of the Otolaryngology Division at the Roosevelt Hospital,

was appointed as Assistant Clinical Professor of Otolaryngology. Additions to the staff in Vanderbilt Clinic who are helping with the instruction of the medical students include Dr. Claudio Crupi and Dr. Alvin Glasgold.

Dr. Carol Ehrlich joined the department on September 1, 1968. Dr. Ehrlich received her Ph.D. at the University of Denver. She has been appointed as Assistant Professor of Otolaryngology (Audiology and Speech). Dr. Ehrlich will also serve as Director of our Hearing and Speech Clinic.

Dr. Elliott C. Greenfield has been appointed as Assistant Professor of Otolaryngology. Dr. Greenfield is a full time member of the staff, who in addition to establishing an oto-neurology clinic at the Neurological Institute and in Vanderbilt Clinic will also engage in basic research.

Dr. Robin Rankow was appointed Assistant Clinical Professor of Anatomy (assigned to Otolaryngology) and Assistant Attending Otolaryngologist. He will work on the head and neck division of the Otolaryngological service.

The basic science courses given to residents in otolaryngology have continued to attract residents from other institutions.

The Department of Otolaryngology continues to have a close relationship with the Otolaryngological Service at the Mt. Sinai Medical School. There is some inter-relation of courses given to residents with the faculty of both institutions playing an important role.

Dr. Daniel C. Baker, Jr. was appointed to the

Committee on Graduate Medical Education of the American College of Surgeons. He continues as a member on the Communicative Disorders Research Training Committee of the National Institutes of Health. He is also a director of the American Board of Otolaryngology.

Dr. John Conley was an active participant in the post-graduate courses given at the University of Kingston, Jamaica; Cook County Post-graduate School of Medicine; and at the American College of Surgeons post-graduate course on neoplasms of the larynx and trachea. He gave the Leroy Schall Lecture at the Massachusetts Eye and Ear Infirmary. He also attended the first German meeting of Plastic and Reconstructive Surgery of the Head and Neck. He attended the International Congress of Cancer in Rio de Janeiro, Brazil. He has several projects under study relating to tumors of the head and neck and reconstructive surgery.

Dr. Jules G. Waltner has been engaged in research work determining the feasibility of stored and irradiated fascia to be used in surgery of the middle ear.

Dr. Milos Basek has continued his research work on the application of ultrasound to the labyrinth through the round window. This procedure has application in the treatment of Meniere's disease.

The new Fowler Memorial research laboratory under the direction of Dr. Juergen Tonndorf opened during the month of September 1968. Dr. Tonndorf has continued his work with the assistance of Mr. Shyam M. Khanna on cochlear physiology. Dr. Tonndorf was elected a member of the Leopoldina Academy, the oldest scientific academy in continuous operation on the European continent. He was also elected a member of the Collegium Oto-laryngologicum.

Visiting fellows from Austria, Dr. Gerd Zechner and Dr. I. Kakizaki from Sendai, Japan worked in the laboratory under the late Dr. Franz Altmann.

Dr. Robin M. Rankow acted as consultant on cancer of the head and neck at the Instituto Radio-Quirurgico in San Sebastian, Spain.

There have been no major changes in curriculum. The department is awaiting the present curriculum study with respect to our future teaching position.

The appointment of Dr. Carol Ehrlich to supervise the Hearing and Speech Clinic represents a new direction in that in addition to patient care some attention will be given to the educational and teaching value of the patients. Dr. Ehrlich is very much interested in the hearing problems of patients with neurological disorders. In conjunction with Dr. Elliott Greenfield a program for oto-neurology will be carried out. It is expected that the facilities for the oto-neurological examining room in the Neurological Institute will be available in March of 1969.

In the Department of Otolaryngology there were 1,929 admissions to the Presbyterian Hospital, 1,064 admissions to the Babies Hospital, 21,577 visits to the Vanderbilt Clinic, 620 consultations, 1,257 operations in Presbyterian Hospital and 665 operations in the Babies Hospital.

Dr. Tonndorf's research program will be expanded now that he has moved into the new Fowler Memorial Laboratory. More space is expected in the Black Building and it is hoped that research in the field of laryngeal physiology and pathology along with speech disorders will be possible.

Major donors to the Department of Otolaryngology include Mr. Walter H. Simson, Mr. Harvey Picker, United States Aviation Underwriters Inc., American Otological Society, Deafness Research Foundation and the National Institutes of Health.

Pathology

DONALD W. KING

Delafield Professor and Chairman of the Department • Director of Service

The department of pathology has continued a closer integration of the eleven divisions of the department by the institution of monthly staff and scientific sessions. The appointment of Dr. Sigmund Wilens as Professor in Charge of Autopsy Service of both the Presbyterian and Delafield Hospital, and the appointment of Dr. Henry Vogel as Head of the Graduate Education Division has done much to strengthen the service and educational responsibilities of the department.

The department held a formal dinner on Feb. 28th at the Faculty Club on the occasion of the 200th Anniversary of the College of Physicians and Surgeons Silver Medallions were presented to former members of the Faculty: Emeriti Professors Dr. Hans Smetana, Dr. William Von Glahn, Dr. Maurice Richter and Dr. Jacob Furth as well as alumni Dr. Fred Lucas (University of Missouri), Dr. Robert Coon (University of Vermont), Dr. Wellington Stewart (University of Kentucky), Dr. Richard Naeye (Hershey Medical Center), Dr. William Carnes (University of Utah), and in absentia, Drs. Frank Vellios, Harry P. Smith, Homer Kesten and Donald McKay.

Teaching

A reorganization of the medical and dental student teaching program has continued. Following the three week survey course, some 75 disease review electives, 24 graduate research electives and 18 special research electives were participated in by 160 medical and dental students.

The department is actively participating in the new proposed curriculum revision in which the pathology core will be reduced from 347 to 182 hours and many of the specialized pathology courses will either be integrated into a second year abnormal biology course, or given as electives in the third and fourth year.

The residency program has continued to accept candidates desiring to complete a two year core rotation through the various divisions of anatomical and clinical pathology followed by three years of specialization in a single field. Special training programs instituted in neuropathology: (Dr. David Cowen), surgical pathology (Dr. Raffaele Lattes) and pediatric pathology (Dr. William Blanc).

At the present time, eight students are enrolled in a graduate program leading to the Ph.D. degree.

There has been established an annual Teaching Colloquium at Arden House. The general format is to emphasize one area of pathobiology, (e.g., immunology, virology, genetics, cell biology, ultra-structure) and correlate it with two organ systems. This year the subject chosen was immunology, correlated with immunological diseases in the heart and kidney. The conference was held October 11 through 13, and was attended by 101 participants. Next year's conference will center on virology, particularly in relation to the kidney and lung diseases.

Research

Dr. Austin D. Johnston, in collaboration with Dr. Sarah Luse (Anatomy), worked on electron

nicroscopic characteristics of Ewing sarcoma and issue culture characteristics of this tumor.

Drs. Henry J. Vogel, Ruth H. Vogel, and Thomas Leisinger are engaged in a detailed examination of biosynthetic pathways, with emphasis on cellular control and biochemical genetics.

Drs. Nathan Lane, Robert Pascal, and Gordon Kaye continued their group investigations on the replication and migration of fibroblasts in the mucosa of the normal colon as well as in hyperplastic and adenomatous polyps of the colon. Dr. Karl H. Perzin is completing a study of mucoepidermoid carcinomas of salivary gland origin. Dr. Richard Snyder, in collaboration with Dr. Raffaele Lattes, is preparing an article on the maturation and differentiation of distant metastases from teratocarcinomas of the testis.

Dr. Lattes collaborated with the late Dr. Arthur Purdy Stout in the preparation of a second edition of the *Fascicle on Soft Tissue Tumors*, part of the *Atlas of Tumor Pathology*, which was published this year.

Dr. Furth continued his investigations on hormones and neoplasia and reported major efforts continuing in two directions (1) exploration of an *in vitro* system, which may be suitable for recognition of responsiveness of mammary tumors *in vivo* to specific inhibitors and stimulants of the mammary gland, (2) continuation of work of hormone production and biolabeling *in vitro* of hormones of rat and human pituitaries and of monomorphous pituitary hormone producing tumors.

Mr. David Palmer and Dr. Theodore Peters have continued their investigation of the diagnostic significance of the level of the total amino acids of the blood, particularly of diseases of the liver and gastrointestinal tract. They have also adapted for automation a method for serum iron and serum iron binding capacity formerly published by Dr. Peters.

Dr. Peters and Dr. Charles A. Ashley (Mary Imogene Bassett Hospital) have continued to study the mechanisms of protein synthesis by the liver under varying conditions. They have used electron microscopic autoradiography to determine the intracellular location of the newly synthesized protein.

Dr. Clinton Van Zandt Hawn has broadened the use of microculture of pathogenic bacteria in capillary tubes.

Drs. Lester Geller, David Cowen and Abner Wolf are continuing their study in rats of the possibility of overcoming or ameliorating the retarding effects of prenatally-induced brain damage upon later learning and memory abilities, by treatment of the

injured animal during its early development. The study also involves an examination of the possible effects of such treatment, both in brain injured and normal animals, on growth and development and motor performance as well as upon certain structural components (e.g. cortical thickness and cell counts) of the developing brain.

Together with Dr. Mario Kornfeld, formerly a Fellow in Neuropathology, and now Assistant Professor of Pathology (Neuropathology) at the University of New Mexico School of Medicine, and the late Professor Franz Altmann, of the Department of Otolaryngology, Drs. Geller, Cowan and Wolf have also completed a study of the ototoxic effect of 6-amino-nicotinamide, a potent antimetabolite of nicotinamide in two strains of mice.

Dr. Phillip Duffy, together with Dr. William Markesberry, is studying the ultrastructure of the pineal gland and of the median eminence with particular attention being paid to the nerve endings. Dr. Duffy is also studying storage diseases with material obtained from human biopsies. Tissues from cases of lipidoses or other storage diseases are being examined by light, phase, and electron microscopy. In conjunction with Dr. Richard Defendini, (Neuropathology), and Dr. Leon Kremsner, (Biochemistry), Dr. Duffy is also studying brain tumors electron microscopically and biochemically.

Dr. Tennyson has carried out electron microscopic, cytochemical and microgasometric studies of the development of cholinesterase in the embryonic dorsal root ganglion and its processes. Also, together with Drs. Martin Hagopian and David Spiro, (New York Medical College), Dr. Tennyson has also conducted an electron microscopic cytochemical study of the development of cholinesterase in cardiac muscle of rabbit embryos.

Other investigative work in the Division of Neuropathology includes a study of the delayed effects of radiation in the cat brain by Drs. Mastri and Chu Chang (Radiology).

Dr. William Blanc continues his work in placental pathology (viral infections) in the morphogenesis of biliary atresia. The occurrence of thrombosis and consumption coagulopathies in premature children is being studied with Dr. Bransilver and Dr. Wigger.

Dr. Joachim Wigger investigated several cases of an unusual congenital tumor of the kidney, the fetal hamartoma. Dr. Goldsmith and Dr. Blanc investigated the pathogenesis of lesions of the vas deferens responsible for sterility in cystic fibrosis.

Investigations on the pathogenesis of intrauterine growth retardation of the rat fetus are continued

by Dr. Blanc. Placental permeability in the experimental model is now under scrutiny in the laboratory of Dr. J. Dancis (Pediatrics, New York University).

Dr. Jacqueline Bartman studied the ultrastructure of placental inflammatory response. Drs. Martinez, Tang and Blanc have analyzed the sequential and topographic development of the immune response of the human fetus, using immunofluorescent techniques.

Alkaline phosphatase of the human placenta has been studied clinically, ultrastructurally, and by immunofluorescence by Drs. Sussman, Bartman and Blanc.

Dr. Henry Azar has continued to work on sarcoidosis, plasma cells, plasma cell tumors and amyloidosis. He also collaborated with Dr. Osserman on the problem of lysozyme-producing leukemia and "Lysozyme-nephrosis."

Dr. Harry Ioachim demonstrated previously that embryonal rat thymus cells infected in vitro with gross leukemia virus (GLV), support indefinite replication of this virus and may, in addition, undergo neoplastic transformation. In a survey of 500 different human tumors, it was found that the tumors most active in cytophagocytosis were those derived from reticulohistiocytic cells.

Dr. Margaret E. Long, in collaboration with Dr. Sheldon C. Sommers, has continued a histochemical characterization of mucins in gynecological neoplasms. Specific histochemical methods for carbohydrate groups have distinguished three epithelial mucusubstances in 50 primary human ovarian serous papillary tumors.

Dr. Elliott F. Osserman's laboratory has been engaged in coordinating clinical, pathological, biochemical, biochemical and immunochemical studies of multiple myeloma and related diseases (plasma cell dyscrasias). These studies focused on the associated disorders of protein metabolism, particularly the gamma immunoglobulins. In the past fifteen years, studies of over 800 patients with various forms of plasma cell dyscrasia have been carried out.

Dr. John A. Terzakis, in collaboration with Dr. Harry L. Ioachim, started work on an ultrastructural study of emperipoleisis in tissue-cultured, virus-induced lymphoblastosis.

Dr. Sheldon C. Sommers continued to study the nature of renal biopsies in kidney disease, as well as experimental rat models. In addition, he continued his study on the prognostic, histological criteria in carcinoma of the human female breast.

With Dr. Sue Buckingham (Pediatrics), Dr.

Sommers continued his study of the functional and structural properties of the alveolar surface of the lung. These studies are directed toward elucidating mechanisms of lung function in such diseases as cystic fibrosis and hyaline membrane disease. Dr. Sommers continued his investigation on carcinoma of the lung. Part of the studies were done with Dr. Shamay Pevzner, who has since returned to continue the studies in Israel.

Dr. Bernard M. Wagner, working with Dr. Ralph Strelbel of the New York Medical College, continued his investigations concerning the mechanisms of connective tissue calcification. The effect of parathyroidectomy on spontaneously occurring calcific arteriosclerosis in female breeder rats was studied. In addition, these investigators demonstrated for the first time that hypervitaminosis-A could produce extensive cardiovascular damage and calcification in the rat.

Dr. Wagner continued his studies on the nature of the Aschoff body and with Dr. Shirley Siew, (New York Medical College) developed a technique for the more effective staining of heart tissue for electron microscopic study. In addition, Dr. Wagner and Drs. S. Mohos (New York Medical College) are continuing their investigation concerning the effect of immune precipitates on collagen. Working with Dr. Char, (University of Hawaii) Dr. Wagner reviewed the course of systemic lupus erythematosus in children and showed that the disease has changed considerably in its natural history with the advent of newer drugs.

Dr. Wagner continued his studies of Aleutian disease of mink with Dr. Robert Leader of the Comparative Pathology Laboratory, Rockefeller University. Their studies indicate that the earliest structural representation of viral infection in the mink appears to be in the biliary epithelial cells of the liver.

Dr. Elly Moschides, with Drs. Theophilus Roberts and Donald P. Swartz and Dr. Suzy Felton (Obs. & Gyn.) are engaged in a pilot study on the effects of contraceptive drugs on clotting factors in patients with sickle cell disease.

Dr. Roberts, in collaboration with Dr. Henry Azar, and Dr. Charles Felton (Medicine), are studying sarcoidosis in the Harlem community.

Drs. Lester Cahn and Melvin Blake are undertaking an investigation of leucoplakia of the mouth. What predisposes the oral tissues to this mischief will be determined by careful correlation of clinical histories together with a histochemical study of the tissue.

Dr. Donald King continued studies on ultrastruc-

ure and biochemical function in mitochondria of tissue culture cells exposed to hypoxia. He has completed work on the cytochrome-c content of L-cells, the effect of hypoxia on cytochrome and heme synthesis, continued studies on the antibody production by single cells, and initiated studies on the cell-free synthesis of cytochrome-c.

Dr. Herbert Stoerk has continued his studies on parathyroid-adrenal interrelations. Dr. Stoerk has also observed in rats that bilateral nephrectomy or bilateral ureter ligation is promptly followed by the appearance of "hyaline droplets" in the cytoplasm of the cells of the glomerular zone. Hypophysectomy or low K feeding prevents the development of these changes.

Honors

Dr. Meyer M. Melicow received the first prize for an exhibit on "Evolution of Urology" at the A. U. A. meeting in May 1968. Dr. Lester R. Cahn was awarded the degree of Doctor of Science, honoris causa, by the University of Birmingham. Dr. Jacob Furth presented a Harvey Lecture on Neoplasia. He was the honored speaker at a WHO conference at Lausanne and at the Thule International symposium at Stockholm.

Dr. Raffaele Lattes was the official guest lecturer from the United States of America at an International Symposium of Children's Tumors at the Instituto Gaslini, Genova, Italy, September 14, 1968. Dr. William Blanc was invited guest speaker at the Colombian Society of Pathology and lectured in Colombia, Peru and Brazil. Dr. Abner Wolf received an Award for Distinguished Service to Neuropathology from the American Association of Neuropathologists. Dr. Wagner served as a Visiting Professor of Pathology at the Hadassah University Medical Center in Jerusalem and the Department of Pathology, School of Medicine, University of Bir-

mingham. In addition, he was a Visiting Lecturer at The Dunn School of Pathology, Oxford University.

Staff Changes

The following were appointed Professors: Drs. Elliott Osserman, Huntington Sheldon, Henry Vogel, and Sigmund Wilens. Dr. Jacob Furth was appointed Acting Director, Institute of Cancer Research and Cancer Coordinator, Columbia University.

Promotions

The following were promoted to Professors: Drs. Phillip Duffy, Nathan Lane, Herbert Stoerk, and Leon Roizin.

The following were promoted to Associate Professors: Drs. Henry Azar, and Austin Johnston.

The following were promoted to Assistant Professors: Drs. Reba Goodman, John Gorman, Ross Grey, Angeline Mastri, Edward Moscovic, Karl Perzin, Myron Tannenbaum, and Virginia Tennyson.

Resignations

The following resignations were accepted with regret: Drs. Eugene Emeson, Filiberto Giacomelli, Martin Hagopian, Harry Ioachim, Alden Loud, Shamay Pevzner, Ralph Snyder, Donald Thursh, David Spiro, John Terzakis, Sheldon Sommers, Joseph Wiener, Heinz Zunker, Eva McGilvray.

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Pediatrics

EDWARD C. CURNEN, JR.

Carpentier Professor and Chairman of the Department • Director of Service

Another step forward in the development program for Babies Hospital was achieved in the spring of 1968 with the opening of a new addition consisting of two floors above ground and two below. This provides accommodation on three floors for service and research laboratories and on the first floor for staff offices, together with a conference room and library given by alumni of Babies Hospital and other friends in honor of Dr. Rustin McIntosh. The Rose Hematology Laboratory was established in memory of the sons of Mr. and Mrs. R. Peter Rose and a laboratory for the Cystic Fibrosis Group was made possible through the gift of Mr. Bernard Peyton. The lobby of the new structure, which eventually will become the main entrance of Babies Hospital, was given by The Heckscher Foundation for Children. The addition of ten more floors to complete the new building is anticipated within the next two years.

Dr. Hattie E. Alexander, Professor Emeritus of Pediatrics and Consultant to the Pediatric Service, died of cancer on June 24, 1968, after thirty-seven years of continuous and outstanding service at Babies Hospital. A distinguished scientist whose contributions to the treatment of meningitis saved the lives of countless children, she was also a compassionate physician, and a provocative teacher.

Dr. Jack Garnant, former house officer and a member of the part-time teaching staff of the Pediatric Clinics since 1958, died in a motor accident on December 12, 1968. He is survived by his wife and five children.

Changes in Staff

Dr. Akira Morishima returned to the department on April 1, 1968 as an Associate Professor to head the Pediatric Endocrinology Group. Drs. Welton M. Gersony, Jennifer J. Bell and Eugene L. Klenk joined the full-time teaching staff on July first, Dr. Gersony as Assistant Professor and Drs. Bell and Klenk as Associates. Dr. Gersony, formerly Assistant Professor of Pediatrics at the Southwestern Medical School of the University of Texas, is the senior pediatric representative in the Cardiovascular Laboratory. Dr. Bell joined the Pediatric Endocrinology Group, having completed four years' training in that specialty here in the Medical Center. Dr. Klenk, a former Chief Resident of Babies Hospital who completed an NIH traineeship in infectious diseases at Tulane University School of Medicine in June, has been assigned to the Pediatrics Renal Group.

The part-time teaching staff in the Pediatrics Clinics was augmented during the year by the appointment as Assistants Drs. Jacob Boris, Burton M. Feinsmith and Carolkay Lissenden. Dr. Lissenden, former Assistant Resident, is in charge of the Pediatric Liver Clinic during the leave of absence of Dr. Ruth C. Harris.

Dr. Gene-Ann Polk joined the full-time teaching staff at Harlem Hospital Center on September 1, 1968, as Assistant Clinical Professor of Pediatrics and Clinical Director of Pediatric Ambulatory Care Services.

Dr. George W. McCormick retired on June 30th

after an association with the Pediatric Service begun in 1946.

Resignations during the year included those of Dr. William A. Silverman, who became Director of the Perinatal Health Center, Children's Hospital, San Francisco; Dr. Joan M. Leeming, to enter the Harvard School of Public Health; Dr. Bettina C. Hilman, who resigned to accept an appointment as Associate Professor of Pediatrics at the Louisiana State University Medical Center-Shreveport School of Medicine.

Promotions as of July 1, 1968, include the following: Dr. James A. Wolff to Professor of Clinical Pediatrics and Attending Pediatrician; Dr. Milton Singer to Associate Clinical Professor; Drs. Anneliese L. Sitarz and Poul A. Kildeberg to Assistant Professor; Dr. Jerry Jacobs to Assistant Clinical Professor; and Drs. Martin I. Lifschitz and Celia Ores to Associate on the full time staff. On the part-time staff, the following were promoted to Associate: Drs. Morris S. Albert, Rose G. Ames, Alexander Blum, Jr., Solomon J. Cohen, Joseph A. Costa, Thurman B. Given, Jr., William E. Homan, Herbert S. Hurwitz, Robert E. Jennings, Joseph E. Kalbacher, John J. Kangos, Shirley A. Mayer, Daniel J. Melia, Walter L. Mitchell, Herbert E. Poch, Morton H. Rachelson, Donald R. Reed, Albert P. Rosen, Mary H. Samuels, Jack G. Shiller, William H. Smith, Walter R. Stankewick, David Stiles, Doris Wethers, Robert West, Robert C. Wheeler, William W. Whitten, Agnes G. Wilson; to Instructor: M. David Atkin, T. Donald Eisenstein, Jane A. Erganian, Douglas Ford, Jr., David N. Franklin, Stanley H. Gilbert, Jr., Bertram H. Grossman, James R. Guthrie, Martin H. Jacobs, Michael Katzenstein, Nicholas Pizzolato, Roderick C. Richards and Donald A. Winikoff.

At Harlem Hospital, Dr. Hugh E. Evans was promoted to Associate Clinical Professor and Associate Director of Pediatric Service and Dr. Leonard Glass to Associate and Director of Newborn Services.

Staff Honors and Activities

Dr. Edward C. Curnen, Jr., led a group of ten physicians on a pediatric teaching mission to Peru during the last three weeks of November. The purpose of the undertaking, which was sponsored by the Unitarian Universalist Service Committee, Inc., of Boston, and a number of Peruvian pediatric organizations, was to discuss and demonstrate North American teaching methods and practices in relation to medical needs and problems in Peru. Approximately 300 Peruvian doctors and medical students participated in the case presentations, lec-

tures, seminars, and informal discussions. At ceremonies concluding the mission, doctors on the team were made honorary members of the Peruvian Pediatric Society.

Dr. Robert W. Winters with members of the Pediatrics Renal, Neonatal, Cardiorespiratory and Cystic Fibrosis Groups and representatives of the Departments of Medicine and Obstetrics and Gynecology conducted a four-day course on acid-base disorders of the fetus, neonate, infant and child in September at Babies Hospital. Eighty-eight physicians from the United States, Canada and Puerto Rico were enrolled in the course.

Dr. Sidney Blumenthal was elected chairman of the Sub-Board on Pediatric Cardiology of the American Board of Pediatrics and continued as chairman of the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association.

Dr. Carolyn R. Denning was appointed to the Center-Institute Committee of the National Cystic Fibrosis Research Foundation for a three-year term beginning in August 1968. She was also appointed to membership in the Medical Care Committee of the National Foundation.

Dr. John C. Sinclair was appointed to the New York City Health Department's Committee on Standards for Intensive Care Nurseries and to the Advisory Committee on Retrolental Fibroplasia of the National Society for the Prevention of Blindness.

Dr. Ruth C. Harris began a year's leave of absence on September 1, 1968, in order to accept an appointment as Visiting Professor of Pediatrics at Yonsei University College of Medicine, Severance Hospital, in Seoul, Korea.

Mrs. Katrina de Hirsch received the award of the Orton Society for her contributions in the field of language pathology in children.

Dr. Stuart S. Stevenson was Visiting Professor of Pediatrics at the State University of New York Downstate Medical Center during the month of September.

Dr. Ralph B. Dell was elected to membership in the American Physiological Society and The Society for Pediatric Research.

Teaching

Pediatric house staff training was reorganized on July 1st into a three-level program consisting mainly of an internship and two years of assistant residency. A straight internship in pediatrics was resumed after a lapse of many years, and eight interns from eight different medical schools were selected

through the National Intern Matching Program. In addition to the customary daily attending rounds on the various floors, a new schedule of specialty rounds was initiated, providing an opportunity for weekly interdepartmental teaching exercises and consultations.

In June, 1968, Dr. Denning was awarded a three-year grant by the Division of Regional Medical Programs of the United States Public Health Service to establish a Pediatric Pulmonary Disease Center at Babies Hospital, one of the first such grants to be made. The major objectives of the program, which deals with chronic non-tuberculous lung diseases in children, are to develop new methods and improve existing mechanisms for the dissemination of information on early diagnosis and optimal care. The program provides opportunity for clinical and community studies, including the collection of descriptive data on disease incidence, morbidity, mortality and natural history. The Babies Hospital Center also will provide intensive teaching and training for both medical and paramedical specialists and technicians as well as for patients and their parents.

Two third-year high school students were assigned to the Cystic Fibrosis Laboratory for six weeks during the summer as part of a program sponsored by the New York Heart Association and the New York City Board of Education to encourage interest in scientific careers.

Under the direction of Dr. Gilbert W. Mellin, the department began utilizing computer systems to evaluate the examination given to third-year medical students during their rotation on the Pediatrics Service. This permits evaluation not only of student performance but also of the third-year pediatrics teaching program.

Patient Care

A Medical Intensive Care Unit was opened on October 22nd on the eighth floor of Babies Hospital to provide constant supervision and sophisticated medical care to infants and children during the acute phase of illness. The Unit is equipped with cardiac monitors and pacemakers, respirators and other new electronic devices and staffed by specially trained personnel under the direction of Dr. Mary Jane Jesse. Through December 31st, there had been 43 admissions.

A new diagnostic and research Pulmonary Function Laboratory has been set up as part of the Babies Hospital Pulmonary Disease Center. Dr. Martin I. Lifschitz supervises this laboratory, which provides services for both in and out-patients.

Drs. William A. Silverman, Lillian R. Blackmon and John C. Sinclair directed the filming of neonatal intensive care procedures by Mr. Hugh Daly of the Babies Hospital X-ray Laboratory. The films will be used as teaching aids to improve the quality of care in the Neonatal Intensive Care Unit.

Test results obtained in the Diagnostic Bacteriology Laboratory are now being recorded daily on IBM cards. A magnetic tape data bank is being maintained in order to retrieve this information with accuracy and speed in the form required.

Admission and discharge data for the first ten months of 1967 have been analyzed to determine how and by whom Babies Hospital was utilized.

A group of 315 patients with cystic fibrosis is being followed regularly at Babies Hospital. Forty-two new patients with this disease were diagnosed during the past year. Sixty-three patients required hospitalization for a total of 1,767 days, an average stay of 28 days. Between 50 and 75 patients with some form of malabsorption or chronic lung disease other than cystic fibrosis were seen by members of the group.

A total of 440 cardiac catheterizations and angiograms were performed on 201 pediatric patients in the Cardiovascular laboratory during 1968. Of the children studied, 74 were infants under one year of age. One hundred and one children were operated upon by open heart techniques, 72 by closed techniques.

Slightly over 600 out-patient visits to the Pediatric Kidney Clinic were recorded during the year.

Dr. Gilbert Simon supervised the division of patients of the Pediatric Urology Clinic (Urology Service) into those with and those without urinary tract infections. He and Dr. Eugene Klenk have assumed supervision of the pediatric and urology house staff assigned to the care of patients with infection.

The following statistics were compiled by the Pediatric Cerebral Palsy Clinic: physical therapy visits, 1,434; occupational therapy visits, 619; speech therapy visits, 295; medical visits, 1,027; dentistry, 371; social service, 574; psychological evaluations, 109.

During 1968, there were a total of 34,996 visits to the pediatric clinics. Of these, 4,921 were to the general clinic, 30,075 to the specialty clinics. New patients totalled 7,512. There were 4,459 admissions to Babies Hospital during the year.

At Harlem Hospital Center, an intensive care unit for full-term and premature newborn infants was established during 1968. Admissions to the Pediatric Service at Harlem dropped during the

ear from 5,378 in 1966/67 to 4,332 in 1967/68. Visits to the Outpatient Department decreased from 5,446 to 25,903, to the Emergency Room from 4,996 to 23,404 during the same period.

Research

Dr. O. Robert Levine, Dr. Robert B. Mellins and Dr. Edward C. Curnen are collaborating on the development of an experimental model of overwhelming infection and shock in the primate. Drs. Levine and Mellins are collaborating on studies of tidal movement in the chest. Dr. Levine has been investigating the use of the extravascular lung water as an indicator of the distribution of pulmonary blood flow. Dr. Mellins has been studying the dynamics of pleural fluid formation. He also has been collaborating with Dr. Gerard Turino (Medicine), Dr. James Malm (Surgery), Dr. Lawrence Eisenberg (Rockefeller University) and Dr. Robert W. Winters on the use of radiofrequency pacing of the phrenic nerve in a patient with a congenital defect in the control of respiration.

Dr. Mary Jane Jesse presented her work on the cardiovascular system in the African Lung Fish at the annual meeting of the American Heart Association. She is continuing her measurements of hemodynamic parameters after open heart surgery in infants and children.

Dr. Joseph M. Bordiuk is collaborating with Dr. Marianne Logato (Medicine), Dr. Robert E. Lovelace (Neurology) and Dr. Sidney Blumenthal in a study of Pompe's Disease with particular reference to the cardiovascular hemodynamic changes, electromicroscopic findings and changes in the electromyogram.

Dr. Sylvia P. Griffiths is collaborating with Dr. Kent Ellis (Radiology), Dr. James Malm (Surgery) and Dr. Blumenthal in a review of the hemodynamic findings following repair of endocardial cushion defects.

Drs. Blumenthal and Jesse are participants in an on-going collaborative prospective study of the natural history of congenital cardiac defects. Dr. Blumenthal is a participant in a study of examination techniques in pediatric cardiology and future requirements for training programs in this field.

Dr. Gilbert W. Mellin, director of the Fetal Life Study, has continued to keep a tabulation of all pregnancies registered at the Columbia-Presbyterian Medical Center or the Sloane Clinic. This record has supplied answers to numerous inquiries concerning events during pregnancy and pregnancy outcome.

In collaboration with Dr. Charles T. Ryder

(Orthopedics), Dr. Mellin is studying further the physical findings in the normal infant hip, legs and feet and their development from birth through six months to one year of age.

Dr. L. Stanley James and Dr. Edward Bowe (Obstetrics and Gynecology) gained further experience with the use of capillary samples from the fetal scalp as a means of monitoring the progress of the fetal acid-base state during labor. Serial samples from 678 fetuses have shown a highly significant correlation between the acid-base state of the fetus during labor and the condition of the infant at birth as graded by the Apgar score ($p < .001$). The value of fetal pH is now being used as an indicator for terminating labor by cesarean section. Dr. James with Drs. Henry Balfour and Stanley Block, Residents in Pediatrics, found that the complication rate from fetal blood sampling was 1%. Serial blood samples were also analyzed for electrolyte composition and glucose content during labor in 42 fetuses by Drs. James and Sonja Sarcia.

Dr. John C. Sinclair completed a study of rates of oxygen consumption in newborn babies and related these to the problem of energetics of fetal development. Dr. Sinclair reviewed problems associated with prolonged nasotracheal intubation in newborn infants. Dr. John S. Coldiron, in a post-mortem study, derived standards for appropriate nasotracheal tube length in neonates. Dr. Sinclair and Dr. Coldiron reviewed the post-natal physical development of low-birth weight babies, taking into account prenatal growth rates. Dr. Sinclair, Dr. Gabriel V. Duc, Dr. Poul A. Kildeberg, Dr. Knud Engel, Dr. Raphael Zapata-Martinez, Dr. Marta Valcarel and Dr. L. Stanley James are collaborating in a study of the effects of early postnatal treatment with oxygen, bicarbonate or THAM in hypoxic, acidotic babies. Drs. Leonard Glass, William A. Silverman and Sinclair completed the second phase of a study at Harlem Hospital of the effect of caloric intake, thermal environment, growth, and cold resistance in small infants after the first week of life. Dr. Sinclair studied the effects of thermal environment on weight loss, survival and metabolic rates in fasted newborn rabbits.

Drs. Valcarel and Zapata-Martinez reviewed the clinical courses and post-mortem findings in newborn babies who underwent umbilical arterial catheterization. Drs. Duc and Engel are developing a rapid *in vitro* method for the determination of oxyhemoglobin dissociation curve. They determined hemoglobin oxygen affinity in a number of newborn babies with differing clinical diagnoses. They are developing a method for the determination of

2, 3-diphosphoglyceric acid in red blood cells, and are relating these measurements to hemoglobin oxygen affinity.

Dr. Robert W. Winters and his colleagues have continued their studies of clinical and experimental acid-base disturbances. Drs. Ralph B. Dell and Winters have been studying the influence of body composition upon the slope of the *in vivo* CO₂ titration curve. They are also investigating the time course of the respiratory response to acute metabolic acidosis. A third series of experiments by Drs. Dell and Winters involves the study of the acid-base effects of arginine hydrochloride infusions in nephrectomized dogs. Dr. Dell has also written and developed computer programs for the collection of derived data and the statistical analysis of these derived data.

Drs. Kildeberg, Engle and Winters continued their detailed series of studies in the dog dealing with the acid-base responses to acute hyperventilation and the effect of hypercapnia upon various acid-base parameters. Drs. Kildeberg, Engel and Winters initiated studies of acid-base metabolism in acute hypoxia in dogs and of the theoretical and methodological aspects of the measurement of net acid balance in growing infants. The techniques used in the latter study have been applied to clinical problems of growth and acid-base equilibrium. Drs. Kildeberg and Winters have also been engaged in experimental work on whole body CO₂ titration.

Drs. Engel and Duc are studying the effect of organic polyphosphates on the oxygen dissociation curve and the influence of the position of this curve on oxygenation of the newborn infant.

Dr. Joan M. Leeming continued her studies on the renal function of children with obstructive uropathy in collaboration with Dr. John K. Lattimer (Urology).

Dr. Morris S. Albert continued his clinical studies of atypical cases of the nephrotic syndrome and of the acid-base changes in chronic renal failure.

Dr. Sue Buckingham with Drs. Sheldon C. Sommers (Pathology), Joel Rothschild (Biochemistry) and W. F. McNary (Anatomy, Boston) related alkaline phosphatase activity to pulmonary alveolar maturation in fetal lung. She and Mr. Martin Wolferstan, P&S '69, investigated fetal morphine tolerance, withdrawal and management with barbiturates in fetal rabbits and chick embryos. An experimental respiratory distress model in rats exposed to hyperbaric oxygen (HOP) was studied by Drs. Buckingham, Sommers and McNary.

During the first eight months of 1968, Dr. John F. Nicholson worked in the Department of Bio-

chemistry of the University of Amsterdam on problems related to the synthesis of citrulline in mitochondria. On September 1, he returned to the Medical Center where he is continuing his work on nitrogen metabolism in infants.

Dr. Katherine Sprunt, Miss Grace Leidy and Miss Winifred Redman are continuing their studies of the normal flora of the human oropharynx; what it is, what maintains it within normal bounds and what its significance may be. The same group is investigating the potential hazards and usefulness of oral antibiotics in the development of antibiotic resistant bacterial flora.

Dr. Edward C. Curnen, Jr., assisted by Miss Eri Tanabe, has continued studies of viral infections in infants and children and selected adult patients particularly those with infections of the central nervous system. During the summer of 1968 an outbreak of viral meningitis caused by ECHO virus type 4 was investigated.

Drs. Hattie E. Alexander and Irene Stachura with Miss Grace Leidy, explored mechanisms of bacterial transformation and the nature of competence. This work has continued since the death of Dr. Alexander. Metal shadowing and thin sectioning techniques are used to study morphologic phenomena occurring during absorption and incorporation of transforming DNA by the recipient cells and during development of competence. The study of *M. tuberculosis* is directed toward altering cell permeability to permit entry of the DNA.

Dr. Akira Morishima has studied the histochemical property of heterochromatin in human metaphase chromosomes by differential digestion of chromosomes utilizing DNA-ase.

Dr. Cyril A. L. Abrams is continuing long-term clinical and cytogenetic studies on individuals with abnormal sex development, and on patients with multiple congenital anomalies. Dr. Abrams and Dr. Jennifer J. Bell are continuing their clinical and laboratory investigations in a group of twenty patients with growth hormone deficiency, who are receiving human growth hormone. Growth responses in these patients are being compared with those who are not receiving human growth hormone.

Dr. Abrams continues to investigate the effect of growth hormone on cellular multiplication. The *in vitro* effect of growth hormone on lymphocytes cultured *in vitro* is being investigated by assessment of mitotic rate and the rate of DNA replication by use of tritium-labeled thymidine and autoradiographic technique. In a parallel study the mitotic rate of cultured lymphocytes is being investigated before and

after *in vivo* administration of human growth hormone in patients with pituitary dwarfism.

Dr. Bell has continued her work in conjunction with Dr. Robert E. Canfield (Medicine) on the purification and structural analysis of human chorionic gonadotropin. They have also initiated a study designed to elucidate the immunologic differences and similarities of human chorionic gonadotropin excreted by male and female patients with trophoblastic diseases, as compared with those excreted by normal pregnant women.

Research in cystic fibrosis and celiac disease continues in three major areas: saliva, fat metabolism and pulmonary disease. Dr. Carolyn R. Denning, in collaboration with Drs. Irwin Mandel and Austin Kutscher (Dental and Oral Surgery) continues the investigation of the composition of submaxillary saliva in patients with cystic fibrosis, their siblings and parents, as well as in patients with asthma. Dr. Zacharias Dische (Biochemistry) continues the study of glycoproteins in submaxillary saliva in collaboration with Dr. Denning.

Dr. Martin I. Lifschitz is investigating the viscosity of various body fluids (sputum, saliva, duodenal fluid, sweat) and ways in which it can be altered in normal individuals and patients with cystic fibrosis.

Dr. Denning, in conjunction with Drs. Barbara Underwood and William H. Sebrell (Institute of Nutrition Sciences), has surveyed vitamin E, vitamin A and carotene nutrition, as well as creatinuria, in fifty patients with cystic fibrosis selected at random. In addition to these studies, the following investigations are underway: the relationship of vitamin E to the fatty acids of red blood cells; the effectiveness of medium chain triglyceride as a vehicle in the absorption of fat-soluble vitamins in the tissues obtained at autopsy of patients with cystic fibrosis; and the chromatographic separation and quantitation of bile salts in duodenal fluid.

Dr. Lifschitz has completed an evaluation of two mucolytic agents, pimetine hydrochloride and As-coxal, and found neither to be effective in patients with cystic fibrosis. Dr. Lifschitz is currently conducting a study to evaluate objectively the clinical effectiveness of antibiotics by aerosol administration in patients with cystic fibrosis and, if possible, to clarify the mechanisms of such improvement.

Drs. Denning, Lifschitz and Celia Ores have begun an antibiotic study in cystic fibrosis designed to obtain objective measurements of the benefit of antimicrobial therapy and help define its relationship to the presence of staphylococcus and pseudomonas in the sputum.

Dr. James A. Wolff, has continued as principal

investigator in studies conducted by Children's Cancer Study Group A related to childhood leukemia and solid tumors. He has had the collaboration of Dr. Anneliese L. Sitarz as associate investigator. Dr. Wolff reported for the group in August in the New England Journal of Medicine the results of a large scale study showing improvement in prognosis of Wilms' tumor with maintenance prophylactic treatment with Dactinomycin. Dr. Wolff has been appointed a member of the National Integrated Wilms' Tumor Committee.

Dr. Wolff participated in a symposium on Thalassemia sponsored by the New York Academy of Sciences in September. At these meetings, in collaboration with Dr. Koon Hung Luke (Pediatrics, University of Hong Kong), Dr. Wolff reported a fifteen year experience in the management of children with Thalassemia followed in the Pediatric Hematology Clinic.

With Dr. Harold Maurer and Dr. Luke, Dr. Wolff has completed an investigation of the albumin-binding capacity of the cord sera of normal neonates and the postnatal sera of infants with hyperbilirubinemia. With Dr. Maurer he has also evaluated the comparative efficiency of two methods of exchange transfusion for hyperbilirubinemia. Dr. Maurer and Dr. Wolff collaborated with Dr. Paul J. Poppers and Dr. Mieczyslaw Finster (Anesthesiology) in an investigation which demonstrated a reduction in concentration of serum bilirubin in offspring of women treated with phenobarbitone during pregnancy.

Dr. Marguerite J. Gates has continued to coordinate the efforts of the Departments of Anesthesiology, Neurology, Obstetrics and Gynecology, Ophthalmology, Otolaryngology, Pathology, Pediatrics and Psychiatry in behalf of the Collaborative Perinatal Research Project. This is a long-term prospective study of the etiology of cerebral palsy, mental retardation and related neurological diseases of childhood.

Drs. Elizabeth Ufford, Rhoda Mickey, Camilla Jones and Yvonne Driscoll have completed the seven year neuropediatric evaluation of approximately half the 2,300 children enrolled in the study at Columbia. A summary code, now being developed, will cover pediatric illnesses, physical findings, and significant historical events between one year and eight years of age.

Dr. Ruth C. Harris continued her research on liver disorders, including galactose enzyme defects, and the use of screening techniques in patients from a wide geographic area distribution.

Identification and management of glycogen dis-

orders and amino acid abnormalities of the liver also continue to be studied. The clinic for study of obstructive problems in collaboration with Dr. Arthur Voorhees and Dr. John B. Price (Surgery) has improved management and understanding of these problems by both departments.

Mrs. J. Jansky is continuing her research on predicting reading disabilities before first grade entrance.

On June 12, 1968, a feasibility study was launched in the Pediatric out-patient department by a team composed of Drs. Dean Martin and Carolkay Lissenden, and Dr. Guy Longobardo and Mr. Ray Pulver of the Advanced Systems Development Division of the International Business Machines, Inc. The purpose of this investigation is to determine the usefulness of computers in the Pediatric Distributing, Specialty and Well Baby Clinics. One of the interesting facts that has come to light as a result of this investigation is that forty per cent of our ambulatory pediatric population (many of whom are eventually admitted to Babies Hospital) do not speak or comprehend English.

The staff of the Pediatric Cerebral Palsy Clinic completed its collaborative study with the cerebral palsy team of the Children's Hospital Medical Center in Boston and concluded that the magnitude of patient evaluations in that city was not practical for the evaluation of all cerebral palsy patients. Further discussions are being maintained with the study team from Boston.

Dr. George B. Ambrose (Orthopedic Surgery) and Dr. Milton Singer are studying the results of surgical treatment in patients with cerebral palsy.

At Harlem Hospital Center, Dr. Hugh E. Evans and Dr. Leonard Glass are investigating micro-erythrocyte sedimentation rates in full-term and premature infants.

Dr. Evans is continuing studies of factors which influence the establishment of skin and respiratory tract flora of the neonate. Dr. Evans and Mr. O. S. Akpata are investigating the relationship of serum immunoglobulin levels to gestational age.

At St. Luke's Hospital Center, Dr. Thomas J. Moore is continuing his work on the permeability

of the red cell membrane and the mechanism of transport of substances across this membrane.

Acknowledgments

The Department of Pediatrics gratefully acknowledges the contributions of the many individuals and organizations that have supported its efforts in research, teaching and patient care during 1968. Among these donors were: the Abbott Laboratories, the Agnes G. Meyer Foundation, Air Shields, Inc., Ardsley Knitwear, Inc., Astra Pharmaceuticals, Inc., Mrs. Louis S. Auchincloss, Bayside Chapter of the National Cystic Fibrosis Foundation, Mr. and Mrs. Ralph Bernstein, Mr. Stuart Betts, Bristol Laboratories, Friends of Robin Burke, Friends and Relatives of Lisa Cavallaro, The Charlpeg Foundation, Inc., The Children's Bureau of the U. S. Department of Health, Education and Welfare, Council for Tobacco Research, U. S. A., Dr. and Mrs. Keith Custer, Division of Regional Medical Programs of the United States Public Health Service, Mr. and Mrs. Norman Freeberg, Mrs. Melvin Garrett, Health Research Council of the City of New York, Mr. William M. Hickey, Hudson Valley News Company, Friends and Relatives of Jamie Jacoby, The John A. Hartford Foundation, The Kanzler Fund, Mr. and Mrs. Arnold Kossoff, Mr. and Mrs. William A. Lange, The Lillia Babbitt Hyde Foundation, The London Company, Manhattan Chapter of the National Cystic Fibrosis Foundation, Mead Johnson Laboratories, The Miles Hodson Vernon Foundation, The National Cystic Fibrosis Research Foundation, National Institutes of Health, Mr. and Mrs. John O'Handley, Mr. and Mrs. George D. O'Neill, Friends of Mary Beth Rice, Peter and Beirne Rose and Family in memory of George and Bartlett Rose, Ross Laboratories, Mr. and Mrs. Fred J. Rossi, Mr. and Mrs. George Rowe, Jr., Le Salon Departemental de New York Eight and Forty, Mr. and Mrs. Murray Segal, Mr. and Mrs. Howard Tuttle, United Cerebral Palsy of New York, Inc., United Cerebral Palsy Research and Educational Foundation, Mrs. William Weideger, The William J. Matheson Foundation and Friends and Relatives of Sheryl Wolfthal.

Pharmacology

BRIAN F. HOFFMAN

Hosack Professor and Chairman of the Department • Pharmacologist

There have been several changes in the staff during the past year. Dr. Frederick G. Hofmann was promoted to Professor and Drs. Arthur L. Bassett and Norton H. Neff were promoted to Assistant Professor. Dr. Harry B. van Dyke, Professor Emeritus of Pharmacology, rejoined the department after serving for several years as Visiting Professor of Pharmacology at the University of Malaya in Kuala Lumpur. Dr. William H. Dantzler, Assistant Professor, resigned to accept a position as Associate Professor of Physiology at the College of Medicine of the University of Arizona. Dr. Donald H. Singer resigned as Assistant Professor to accept a position as Associate Professor of Medicine and Pharmacology at the Northwestern University School of Medicine in Chicago. Dr. Robert E. Ten Eick, a recent graduate, accompanied Dr. Singer to Northwestern and accepted the position as Assistant Professor of Pharmacology. Dr. Erminio Costa (assigned to Neurology), resigned to accept a position as Chief, Laboratory of Preclinical Pharmacology, National Institutes of Mental Health in Washington, D. C. (St. Elizabeth's Hospital). Drs. Norton Neff, and Benjamin Weiss accompanied Dr. Costa and accepted positions at St. Elizabeth's Hospital.

Dr. Jun-Ichi Suzuki, Lecturer, and Dr. Kohji Tokumasu, Senior Lecturer, at the University of Tokyo joined the department as Assistant Visiting Professors to work with Dr. Shih-Chun Wang. Dr. Bhuvaneshwar P. Jaju, Lecturer at the K. G. Medical College in Lucknow, India, and International

Research Fellow of the National Institutes of Health, also spent part of the year in Dr. S. C. Wang's laboratories. Dr. Antonio Paes de Carvalho from the Institute of Biophysics in Rio de Janeiro joined the department as Visiting Professor for the month of September. Dr. Keiko Yamafuji, Associate Professor, Nakamura-Gakuen College, Fukuoka, Japan came to the department for four months as a Research Associate to collaborate with Dr. Lowell M. Greenbaum. Also working with Dr. Greenbaum is Dr. Regina C. de Rosa Stella, Visiting Fellow from the Escola Paulista de Medicina in San Paulo, Brazil.

During the year, Robert E. Ten Eick and Andrew L. Wit completed their graduate studies and were awarded the Ph.D. degree. Miss T. C. Tseng completed requirements for the M.S. degree. Eleven other students were in residence as candidates for the Ph.D. degree. New postdoctoral fellows and trainees included the following: Drs. Paula Bursztyn, H. Dix Christensen, Abbott J. Krieger, William J. Mandel, Harry Morgan, Robert J. Myerburg, and John W. Stewart. In addition, the appointments of the following trainees and fellows were renewed: Drs. Elizabeth E. LeBourhis, John H. Licking and Harold C. Strauss.

During the year Miss Jui-Chun Chang was designated as the Rudolph Bircher Fellow, supported by a gift from the Sandoz Foundation, and Mr. Peter J. S. Chiu and Dr. Sadhana S. Sathe were designated the Geigy Fellows.

Research

Dr. Wilbur H. Sawyer has continued his studies on the neurohypophysial hormones among vertebrates. Further attempts have been made to identify principles found in elasmobranch fishes. Dr. Maurice Manning, Department of Biochemistry, McGill University, has collaborated by synthesizing peptides related to the known natural principles that might be expected to occur as evolutionary intermediates when the probable changes in the genetic code are taken into consideration. The activities of these peptides are interesting in themselves since they provide further insight into structure-activity relations. In addition, by comparing them to highly purified natural hormones one can test possible identity. Dr. Sawyer has also studied in detail the diuretic and vasopressor responses of the conscious African lungfish to its "antidiuretic" hormone, arginine vasotocin.

Drs. Brahim Lahlou and Sawyer have studied several aspects of osmoregulation and its endocrine control in goldfish. They have also performed isotopic studies on sodium and water balance in the toadfish, an anglerular, but euryhaline teleost. Drs. Sawyer and Dantzler have collaborated on a study of the apparently competitive antagonism by probenecid of responses by snakes and frogs, *in vivo*, and by the frog or toad bladder *in vitro* to arginine vasotocin and other neurohypophysial peptides. Such antagonism has not been demonstrated in mammals.

With the collaboration of Drs. Suzuki and Tokumasu, Drs. Licking, Jaju, and S. C. Wang currently are investigating the effects of various antimotion sickness drugs on the vestibular functions. Drs. Christensen and S. C. Wang are studying the neural pathways between the pre-optic region and the pons which are responsible for polypneic panting. Dr. Krieger, working with Dr. S. C. Wang, is investigating the influence of the reticular facilitatory system on respiratory neurons in the central respiratory complex. Mr. Michael C. Koss, a graduate student, is starting a study in Dr. S. C. Wang's laboratories on the location of reactive points in the central nervous system which cause contraction of the nictitating membrane and dilatation of the pupillary sphincter.

In collaboration with Dr. LeBourhis, Dr. F. G. Hofmann continued his studies on the purification and kinetic properties of steroid C-17 α hydroxylase activity of the guinea pig testis and adrenal cortex. One goal of the study is to determine if the identical enzymatic system is present in both glands.

In collaboration with Dr. Norman Kahn, Dr.

H. H. Wang has completed a study on the effect of tetrodotoxin on central vasomotor and respiratory control mechanisms in dogs and cats. In collaboration with Dr. Marvin R. Blumenthal, she is continuing a study correlating increases in serum enzyme activities and the degree of myocardial damage caused by myocardial infarction in the dog. In collaboration with Dr. Harry Morgan, a Senior Resident from the Department of Radiology at Presbyterian Hospital, Dr. H. H. Wang has started a study on the cardiovascular effects in the dog of radiographic contrast agents. Dr. Paula Bursztyn and Dr. H. H. Wang have studied the central autonomic control of regional blood flow in the cat.

Dr. Onn-Leng Chan, Lecturer in the University of Malaya, and Dr. van Dyke studied the effects of methanol and alcohols higher than ethanol on the bio-assay of antidiuretic hormones in the rat. They also collected neurohypophyses from the large Malayan lizard, *Varanus salvator* and studied some of the effects of extracts of the gland.

Dr. Norman Kahn continued his studies on the effects of autonomic neurons on salivatory secretion. In collaboration with Dr. Irwin Mandel (Dental and Oral Surgery) and Dr. Licking he studied the differences in protein and ionic content of saliva elicited by sympathetic and parasympathetic nerve stimulation in the cat. In collaboration with Drs. Zacharias Dische (Ophthalmology), Licking and S. C. Wang, he studied the characteristics of the different salivary proteins in submaxillary saliva secreted in response to sympathetic and parasympathetic nerve activity. He also is studying the salivatory pathways in the central nervous system of the cat.

With Drs. B. F. Hoffman and Bartelstone, Dr. Bassett continued studies on the length-tension and force-velocity relationships of mammalian myocardium. With Drs. John T. Bigger (Medicine) and B. F. Hoffman, Dr. Bassett completed a study on the actions of diphenylhydantoin on the mechanical properties of cardiac muscle. In parallel studies, Drs. Bigger, Strauss and B. F. Hoffman examined the effects of diphenylhydantoin on the electrophysiological characteristics of several atrial cell types and on mammalian cardiac Purkinje fibers. Dr. Bassett and Dr. Bursztyn have initiated a study on the effects of several pharmacological agents on excitation and contraction phenomena in cardiac muscle. With Dr. Robert M. Weiss (Urology, Yale University School of Medicine), Dr. Bassett continued to study the effects of ouabain and other inotropic agents on mechanical performance of ureteral smooth muscle.

In collaboration with Dr. Bassett, Dr. Herbert J. Bartelstone continued to study the contractile properties of mammalian cardiac muscle. These studies have as their objective a determination of the extent to which phenomena occurring during diastole modify the characteristics of ensuing contractions. Mrs. Judith Palfrey, a second year medical student, participated in these studies. A part of these studies was concerned with interactions between the effects of acetylcholine, digitalis and local anesthetics. Dr. Lowell M. Greenbaum continued to examine the role of leucocytes in forming and destroying vasoactive peptides such as bradykinin. These studies were carried out in collaboration with Dr. Yamafuji and two graduate students, Mr. Richard Freer and Miss Jane Chang.

Drs. Singer and B. F. Hoffman, with Dr. Gerard Kaiser (Surgery) and James R. Malm (Surgery) continued their studies on the production of chronic atrial arrhythmias in the canine heart and with Dr. Paul D. Harris (Surgery) completed a series of studies on the use of epicardial pacing to control cardiac arrhythmias in patients who had undergone open heart surgery. Drs. B. F. Hoffman, Albert L. Waldo (Medicine) and Kari J. Vitikainen (Surgery) have continued their studies on the sequence of activation of human atria in an attempt to improve the diagnostic value of electrocardiographic changes. These studies, conducted in collaboration with Drs. Malm and Dr. Frederick O. Bowman, Jr. (Surgery), have been greatly facilitated by the opening of a new laboratory adjacent to the Open Heart Recovery Room. Drs. B. F. Hoffman, Myerburg and Stewart have begun studies on the identification and characterization of pacemaker tissues in canine atria.

Activities

During the year Dr. F. G. Hofmann attended the Third International Congress of Endocrinology in Mexico City and was an Invited Lecturer in Pharmacology at the College of Medicine of the University of Arizona. He was appointed a member of the Publications Committee of the Endocrine Society and a member of the Editorial Board of *Endocrinology*. Dr. S. C. Wang was invited by the government of the Republic of China to attend the Election Meeting of the Academica Sinica and also to serve as a consultant to their National Science Council Conference for development of a Biomedical Science Research Program. Dr. Sawyer attended the Third International Congress of Endocrinology, Mexico, June 30-July 5, 1968, and served as chairman of a symposium on the taxonomic specificity of hormones. He also attended the 24th Interna-

tional Congress of Physiological Sciences and chaired a session in comparative physiology. Dr. Sawyer was "National Lecturer" at the Section meeting of the Society for Experimental Biology and Medicine in Seattle and spoke on evolution and neurohypophysial functions. He also was an invited official participant in the United States-Japan Cooperative Science Program Seminar on Endocrine Glands and Osmoregulation in Fishes held in Tokyo. Dr. Sawyer continues to serve on the Editorial boards of *Endocrinology* and *General and Comparative Endocrinology*. Dr. Norman Kahn was elected to membership in the American Physiological Society and to the Editorial Advisory Board of the *International Journal of Neuropharmacology*. Dr. Bartelstone was elected to fellowship in the American College of Dentists, to membership in the American Physiological Society and to Associate Fellowship in the New York Academy of Medicine. Dr. Greenbaum was elected to membership in the Faculty of Pure Science at the annual meeting of the Federation of American Societies for Biology. Dr. Greenbaum served as chairman of a television panel on legislation concerning use of animals in research. Dr. Paul F. Cranefield continued to serve as Editor of the *Journal of General Physiology* and as a member of the History of Life Sciences Study Section of the National Institutes of Health. Dr. B. F. Hoffman continues to serve as a member of the Pharmacology and Toxicology Training Committee of the National Institutes of Health. Dr. B. F. Hoffman delivered the first Wilson-Myers Lecture of the Michigan Heart Association and served as Chairman of the Symposium on Excitation-Contraction Coupling in Cardiac Muscle at the 24th meeting of the International Congress of Physiological Sciences.

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The department is indebted to the following donors whose generosity in the form of gifts and grants have supported and helped broaden its programs of research and training: American Heart Association, Inc.; National Science Council, Republic of China; E. I. du Pont de Nemours and Company; Geigy Research Laboratories; Health Research Council of the City of New York; Hoffman-LaRoche, Inc.; Life Insurance Medical Research Fund; Mead Johnson Research Center; National Institutes of Health of the United States Public Health Service; National Science Foundation; New York Heart Association; Parke, Davis and Company; John Polacheck Foundation for Medical Research; Sandoz Pharmaceuticals and Warner Lambert Research Institute.

Physiology

JOHN V. TAGGART

Professor and Chairman of the Department

Dr. Walter Stanton Root retired this year and was designated Professor Emeritus of Physiology after thirty-one years at the College of Physicians and Surgeons. His wise counsel and gentle humor will be sorely missed by his colleagues here. Dr. Root is now working with the Rockefeller Foundation in Bangkok, where he is participating in the organization of the Physiology Department at the University of Medical Sciences. Dr. William Welch Walcott also retired as Associate Professor after twenty-seven years at the College. Dr. Martin Blank was promoted to Associate Professor and Dr. George Krauthamer was appointed Assistant Professor.

Mr. Arnold Oronsky completed his graduate studies and is now a fellow in the Department of Medicine at Harvard. Fourteen candidates for the Ph.D. in physiology are currently in residence. Eighteen postdoctoral fellows and visiting scientists participated in the research activities of the department, and eight medical and dental students engaged in elective research.

Dr. John V. Taggart was appointed to the Board of Scientific Counselors of the National Heart Institute. Dr. Werner R. Lowenstein was appointed Editor in Chief of the new *Journal of Membrane Biology*, continued as Chief Editor of the *Handbook of Sensory Physiology*, and served as Chairman of the Gordon Research Conference on Cell Contact and Interaction. Dr. William Nastuk served as Chairman of the President's *ad hoc* Committee on Bioengineering. Dr. Louis Cizek continues as Secretary-Treasurer of the Society of Experimental

Biology and Medicine and as Managing Editor of the *Proceedings*.

Research

Dr. Nastuk and his associates have continued to study the action of drugs and other agents on neuromuscular transmission. Dr. Joannes H. Karis (Anesthesiology) has investigated the action of neostigmine and its diethyl analogue and, with Dr. Richard J. Kitz (Anesthesiology) is searching for a hydrolyzable curare-like neuromuscular blocking agent. Dr. Aaron J. Gissen (Anesthesiology) has investigated the actions of decamethonium and geramine diacetate on neuromuscular transmission. Mr. J. D. Koester, graduate student, investigated the postjunctional action of a series of related quaternary ammonium compounds and Mr. Alan Edelson, graduate student, is investigating certain alkyl bis-quaternary ammonium compounds. Studies have also been continued on the contractile mechanisms of skeletal muscle. Dr. Luis Marco has studied the action of caffeine and other drugs in producing oscillations of the contractile elements. Mr. L. Schiff, graduate student, has begun studies of sarcomeric oscillations in single muscle fibers. Drs. Terry Mikiten and Marco have demonstrated the release of calcium in muscle by a new histochemical technique. Dr. Mikiten has been investigating calcium loading and potentiation of the contractile mechanism in drug treated muscle. Drs. Rodney Parsons and Nastuk have completed their study of calcium activation in depolarized muscle fibers. Dr. Nastuk

and Dr. O. J. Plescia of the Institute of Microbiology at Rutgers have continued their experiments designed to produce autoimmune responses to muscle in experimental animals.

Dr. Loewenstein and his associates continued work on intercellular (junctional) communication, the control mechanisms which regulate junctional membrane permeability, and the possible roles of junctional communication in the regulation of cellular growth and differentiation. Dr. Sidney J. Socoar and Dr. Alberto Politoff found that junctional membrane permeability depends on energy metabolism. Miss Brigit Rose, graduate student from the University of Munich, investigated the action of lithium ions on junctional membrane permeability. Dr. Asim Jamakosmanovic of the University of Sarajevo showed that junctional communication is interrupted in thyroid cancer, and Dr. Carmia Borek of the Weizmann Institute and Dr. Shoji Higashino obtained similar results in two lines of cancerous liver cells and in x-ray transformed embryonic epithelioid cells in tissue culture. Dr. Hans Berndes, Visiting Assistant Professor from the Max-Planck Institute of Tubingen, investigated the effects of interruption of junctional communication on cellular differentiation at the chromosomal level. Dr. Wolfgang Michalke of the University of Cologne and Dr. Frederic Rodesch of the University of Brussels have started work on possible relations between junctional communication and the control of cell division in tissue cultured systems.

Drs. Magnus Gregersen, Shu Chien and Shunichi Usami have continued studies on blood viscosity at near zero-flow conditions. With Dr. Vojislav Magazinovic of the University of Sarajevo, they have examined the importance of erythrocyte deformability by comparing normal erythrocytes with acetaldehyde-hardened erythrocytes, and have demonstrated with erythrocytes from several mammalian species (elephant, man, dog, sheep and goat) that the viscosity of suspensions of hardened erythrocytes is independent of erythrocyte cell volume over an 8-fold range. Dr. Cyrus Bryant has investigated erythrocyte deformability and membrane fragility by filtration through polycarbonate sieves. With Dr. John Bertles of St. Luke's Hospital, viscometric studies have been made on irreversibly sickled cells from patients with sickle cell anemia. The rheological effects of a new polypeptide synthesized from glutamic acid have been compared with those of dextran and other plasma expanders. With Dr. Anthony Benis (Chemical Engineering), *in vitro* blood viscosity is being compared with *in vivo* meas-

urements on perfused gracilis muscle. Mr. Gregory Farrell, graduate student from Chemical Engineering, is developing a model for the study of the effect of rouleaux size on blood viscosity. Drs. Chien, Dellenback, Usami, Magazinovic and Mr. Dennis Gustavson, medical student, continued studies on circulatory, metabolic and endocrine changes in hemorrhagic shock in dogs and monkeys.

Drs. Cizek and Mero Nocenti have demonstrated two clearly defined actions of estrogen in the polyuric-polydipsic rabbit: an acute inhibitory effect on fluid exchange independent of neurohypophysial or mineralocorticoid involvement, and a delayed and chronic reduction of urinary sodium excretion independent of adrenal cortical mediation. With Miss Susan Kovage, medical student, estrogen influence on salt and water storage in connective tissue was studied.

Dr. David Schachter and Mr. Szloma Kowarski continued studies on the role of vitamin D in intestinal absorption of calcium and have achieved a 125-fold purification of a calcium-binding protein which is present in the intestinal mucosa. Dr. Ellen Batt has completed a study of the development of calcium transport in the intestine of newborn rats and mice. She is now examining the role of vitamin D in intestinal absorption of phosphate and has shown that phosphate absorption is increased via restricted channels in the mucosa. Judith Zola, graduate student, is studying the stimulation of ferritin synthesis by iron. The molecular basis for accumulation of substances by bacteria is under investigation. This work was aided by three medical students, Matthew Guy and Raymond Stark of P&S and Jeffrey Fleigel of the University of Buffalo.

Drs. Martin Blank and John Britten have continued their studies of the enzyme believed to be involved in the transport of ions across cell membranes and also of their proposed theory to account for the ion fluxes in excitable membranes. Dr. George Sweeney, Visiting Assistant Professor from McMaster University, is developing techniques for the study of artificial bilayers. Dr. Blank, with Mrs. Beatrice Lee and Allan Goldstein, have found that the surface active material in normal lung has some unusual properties that may contribute to its effectiveness in stabilizing the lung. Dr. Blank has also continued his studies of the intermolecular interactions in protein monolayers and of the passage of water through these ultra-thin films.

Drs. Raimond Emmers and Valentin Corpus have demonstrated that sensory impulses in thalamic neurons are grouped into separate and distinct patterns

for tactile, pressure, thermal and taste modalities. With Dr. R. R. Tasker of the University of Toronto, Dr. Emmers is engaged in the construction of models of the somesthetic sensory projections of the human thalamus. Mrs. Kathleen Tomasulo, graduate student, is studying the interaction of ascending spinal pathways in the gracile nucleus and the thalamus of the rat. Christina Sekaer, graduate student, analyzed the functional organization of the trigemino-solitary nucleus system in the cat.

Dr. Roy Costantin, with Drs. R. H. Adrian and L. D. Peachey at the Physiological Laboratory in Cambridge, examined the manner in which activation of the contractile mechanism in frog skeletal muscle spreads inward from the surface of the muscle fiber and, using voltage-clamp technique, demonstrated that the depth of contraction could be graded as the amplitude of the stimulus applied to the fiber surface was varied.

Dr. Richard C. Mason's studies of compensatory renal hypertrophy have continued in collaboration with Drs. Stanley E. Bradley, Jaime Coelho and Juang-Chung Chien (Medicine). Mr. Walter Stingle, medical student, has continued work on the length-tension relationships of canine bladder smooth muscle. Mr. Steven Gunther, medical student, investigated the possible effects of altering plasma protein concentration on kidney function. Dr. David T. Schwartz (Urology) continued his studies in dogs on the mechanism of the hypotensive effect of port-

caval transposition in experimental renal hypertension. Dr. Selwyn Levitt (Urology) studied the relationship between abdominal and bladder pressure in dogs.

Dr. George Krauthamer has continued his investigation of the interrelationship between the basal ganglia and polysensory afferent activity. Dr. Paul Witkovsky has continued his studies on brightness and color perception in carp retina and on the neurophysiological basis of feeding behavior in pigeons. Dr. Arthur Karlin and Mr. Mitchell Winik (Chemistry) have developed and studied some highly specific affinity labels for the acetylcholine receptor in the electroplax of the electric eel and will utilize radioactive labels for the isolation of the receptor.

Major Donors

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Psychiatry

LAWRENCE C. KOLB

Professor and Chairman of the Department · Director of Service

With great sadness, the department reports the loss through death on May 15, 1968 of Dr. William A. Horwitz, Professor of Clinical Psychiatry, Attending Psychiatrist of the hospital and Assistant Director of the New York State Psychiatric Institute. Beloved by students, patients and faculty, Dr. Horwitz gave fully of himself since his initial appointments to the faculty and the hospitals in 1928. His special contributions came in the areas of clinical research relating to the applications of the shock therapies and the use of the psychotropic drugs. In the treatment of the chronic and intractable cases of depression, he observed and postulated the correlation of clinical improvement with induction of physiologic inhibition of functions of the autonomic nervous system.

The department welcomes the return from Baylor University of Dr. Shervert H. Frazier as Professor of Clinical Psychiatry and Attending Psychiatrist in the hospital. Dr. Frazier has also been appointed to the new position of Deputy Director of the New York State Psychiatric Institute. At Baylor University he served as Professor and Chairman of the Department of Psychiatry and was called as well to act temporarily as Dean and Commissioner of Mental Hygiene of the State of Texas. Dr. Frazier will assume the administrative responsibilities formerly carried by Dr. Horwitz as well as instructional activities for the second year medical class and residents in psychiatry.

Dr. Maurice M. Rapport was appointed Professor of Biochemistry and assigned to this department in

charge of the Laboratory of Pharmacology at the New York State Psychiatric Institute. Dr. Rapport, formerly American Cancer Society Professor of Biochemistry at the Albert Einstein College of Medicine, identified serotonin in 1949, a discovery which led to its chemical synthesis and later recognition of its probable great importance in neural function. In recent years his investigations have been concerned with chemical structure as it influences the function of all membranes.

Dr. Arthur E. Vallenstein has been appointed Turner Visiting Professor of Psychiatry, Psychoanalytic Clinic for the current year.

Dr. Samuel Bullock joined the faculty of the Division of Community Psychiatry July 1, 1968 as Assistant Clinical Professor of Psychiatry. He shares his time equally between this Division and the Community Psychiatry Program of Harlem Hospital's Department of Psychiatry.

Dr. Archie R. Foley has been appointed Chairman, Department of Psychiatry, The Catholic Medical Center of Brooklyn and Queens. He retains his appointment as Assistant Clinical Professor of Psychiatry and continues to contribute to teaching, participates in curriculum planning, and as a consultant in some administrative aspects of the program.

Dr. Joseph Schachter resigned as Assistant Clinical Professor to accept an appointment as Associate Professor of Psychiatry in the School of Medicine, University of Pittsburgh, School of Medicine. Other resignations were: Dr. Saul Karlen, Assistant Clinician

cal Professor; Dr. Marynia Farnham, Special Lecturer, after thirty years of outstanding service; Dr. Bernard Steinzor, Lecturer; Dr. Geoffrey J. Newstadt, Research Associate; Drs. Horace DeWitt and Judith Schachter, Associates and Assistant Psychiatrists, Vanderbilt Clinic; Drs. Hraig M. Babikian and Alan Elkins, Instructors and Assistant Attendings, Vanderbilt Clinics; Drs. Albert Goldberg, Sonia W. Hyman, James J. Warde and Nancy A. Durant, Instructors; Drs. Frederic A. Alling, June A. J. Christmas, Gladys Egri, Jean Keller, Harold B. Esecover and Ethel S. Person, Assistant Attendings, Vanderbilt Clinic; Drs. Alexander Hoffer, Carlotta L. Schuster, Julius G. Mendel and Donald A. Moses, Assistant Psychiatrists, Vanderbilt Clinic.

Dr. Crawford Clark returned to the faculty as a Research Associate after a year's leave of absence at the Bell Laboratories, Holindel, New Jersey. Dr. Daniel Stern was appointed to a post-doctoral research fellowship under Dr. Howard Hunt. Dr. Augustus Kinzel received a National Institute of Mental Health Career Teacher appointment in the department.

Honors

Dr. Lawrence C. Kolb was elected President of the American Psychiatric Association and also of the American Board of Psychiatry and Neurology. Dr. Leon Roizin was elected Honorary Member, Societa Italiana di Neurologia, Lexione di Neuropatologie, Italy. Dr. Gerald Cohen was awarded the Claude Bernard Science Journalism Award for his article "The Riddle of the Dangerous Bears." Mr. Jerome Leibowitz, Class of 1969, received a award from the American Society of Pharmacology and Experimental Therapeutics for his student research carried out in Dr. Cohen's laboratory. Dr. John D. Rainer was awarded an honorary degree of Doctor of Letters by Gallaudet College, Washington, D. C. as acknowledgment of his work in the field of psychiatry for the deaf.

Teaching

Under the direction of Drs. Roger Mackinnon and Alexander Levay, the department initiated a training program in psychiatry for general practitioners supported by a grant from the National Institute of Mental Health. The first class of eleven practitioners completed the one year of instruction in June 1968; a new class of twelve has been enrolled. Each physician brings to the class their own cases with psychiatric problems and the continuing treatments of these cases is supervised through seminar discussions throughout the year. It was found possible to refer to the physicians in training forty

selected patients studied diagnostically in the Vanderbilt Clinic who did not have, but wished private care.

A post-doctoral training program in psychiatric epidemiology was initiated with the support of a grant from the National Institute of Mental Health made to Dr. Ernest M. Gruenberg. Dr. Alex Richman of the Division of Epidemiology, School of Public Health and Administrative Medicine, is in charge of this new training program.

Dr. Frank Jewell in collaboration with the faculty of the Mental Health Project at the School of Nursing has produced a teaching film entitled "Robin Darryl and Peter; Three to the Hospital." The film illustrates the experiences of three children of different cultures, ages two and one-half to three years at Babies Hospital during elective surgery and recovery.

Professor Rene Dubos of the Rockefeller Institute delivered the Thirteenth Annual Sandor Rado Lecture on November 20, 1968 at the New York Academy of Medicine. His topic was "Deep are the Roots: the Biological Basis of Individuality."

The University Council has approved, at the request of the Division of Community Psychiatry, the awarding of the degree of Master of Science in Community and Social Psychiatry for graduates of this divisional program. Previously the degree awarded had been the Master of Science in Administrative Medicine or a Master of Public Health. This new degree more clearly indicates the kind of training and professional preparation for which the degree is awarded.

In cooperation with the Columbia University Law School, the Division is offering an elective course for third year law students entitled "Seminar in Psychoanalysis and the Law," conducted jointly by Dr. Augustus F. Kinzel, NIMH Career Teacher Award recipient in the Department of Psychiatry and Martin Levine, Visiting Professor of Law.

The Division conducted an NIMH supported Boston University Institute of Community and Social Psychiatry for the faculty of the Boston University Department of Psychiatry. Evaluation of the Institute is now in progress and the proceedings are being prepared for publication.

Research

Dr. Donald S. Kornfeld and Steven Katz, in collaboration with Dr. Paul Harris of the Department of Surgery, have found an eleven percent incidence of bleeding peptic ulcer in the period immediately following cardiac surgery. They are presently analyzing data to determine what the contributing factors may be.

Drs. Donald S. Kornfeld, Stanley Heller and Kenneth Frank, have now completed the first year of their project, on the psychiatric complications of cardiac surgery.

Drs. Richard Druss and John O'Connor are continuing investigations of post-colectomy patients. A more intensive analytically oriented study of three patients is planned for this coming year. Drs. John O'Connor, Bruce Ballard, Michel Milano and Mrs. Lenore Stern have begun to study the effects of psychotherapy and psychoanalysis on sexual disorders. Dr. Jerome Steiner has initiated a study of patients with chronic ulcerative colitis who are under treatment with either antidepressants or tranquilizers. The purpose of the study is to evaluate the effects of these drugs in patients not in psychotherapy and the effect of the drug on the course of the disease as manifested by symptomatic and roentgenographic ratings.

Dr. Jesse Schomer has been working with non-white patients to get data on their family structure. A study which relates clinical variables and therapeutic variables to cognitive and perceptual style is being continued by Drs. Daniel Shapiro, Robert Michels and George O. Papanek. Work concerned with an evaluation of the factors and methods in relation to patient and therapist which determine the outcome of psychotherapy in chronic ulcerative colitis is being conducted by Drs. Aaron Karush, John F. O'Connor and George E. Daniels. Plans are also underway for a ten-year follow-up study with patients who have already participated in a prior part of the project. Dr. Bluma Swerdlow is continuing to work on two major projects: the adaptive balance profile study and her work with the Oral History Research Office of Columbia University. Dr. Swerdlow is also working with the Wickes Foundation on an Oral History Project concerned with Carl Jung.

Drs. Aaron Karush, B. Ruth Easser and Stanley Lesser are continuing to compare the deprivation of perceptual losses such as hearing and sight to the loss of social and economic deprivation in terms of ego development and learning capacity with children. Dr. Robert Spitzer has written a computer program for psychiatric diagnosis, utilizing current state and historical information. The agreement between the computer derived diagnoses and clinical diagnoses on a set of patients was as high as that between a group of clinicians on the same patients.

Dr. Ronald Fieve reports that in a double blind study of lithium and thorazine or lithium and imipramine in the treatment of manic-depressive patients, a

seventy to eighty percent effectiveness of lithium occurs within five to ten days after initiation of administration in the acute manic phase. In the double blind study of acute endogenous depression, lithium appears to have little value compared to imipramine. A study underway compares the effects of imipramine, tofranil, lithium salts and placebo in a single blind study to examine the effectiveness of lithium as a prophylactic agent in preventing further recurrent affective attacks. The data from this study shows that lithium has a tendency to decrease depressive scores over time, most likely due to its potent anti-manic effect and its mild antidepressive action. Drs. Platman, Fieve and Miss Little, have completed an investigation of the absorption and excretion of lithium in a small number of patients and control subjects.

Dr. Herbert L. Meltzer extended his studies of the interaction of stradiol with monovalent ions to include lithium, rubidium and caesium and obtained results that suggest that each of these substances is capable of altering the permeability of nerve cell membranes. Dr. Benjamin Weiss and Mr. Richard L. Stiller continued their study of the biosynthesis of long-chain bases.

Dr. George J. Alexander confirmed in thousands of Wistar rats his early findings that administration of lysergic acid diethylamide (LSD-25) early in pregnancy, orally or subcutaneously, leads to a three-fold increase in fetus resorptions, abortions and offspring mortality, but not in the number of deformed offspring.

In collaboration with Drs. Kopeloff and Taylor, Dr. Alexander continued his studies of the chemistry of epilepsy. With his co-workers of the Neurotoxicology Research Unit at the Bronx State Hospital, Dr. Alexander assisted Dr. Leon Roizin in his investigations of the toxicology of tranquilizers of the phenothiazine group.

Dr. Maurice Rapport and his associates, Drs. L. Graf, D. L. McCollester, D. L. McIlwain and K. Inoue are continuing their studies of the structure and function of complex lipids in cell membranes with particular emphasis on their immunochemical reactions.

Dr. Leonore M. Kopeloff reports that in studies with Dr. Joseph Chusid on the cerebral effects of metal oxides indicated that chronic epilepsy could be induced in the monkey following implantation of two oxides of antimony. Diazepam (Valium) was shown to be a highly effective anticonvulsant in chronic epileptic (alumina) and control monkeys challenged with Metrazol. In collaboration with Drs. George Alexander and Reginald Taylor, it was

found that a single parenteral dose of Metrozol in the monkey produced a decrease in serum cholesterol in twenty-four hours. Chronic oral administration of sub-convulsive doses induced a marked hypocholesterolemia for periods up to one year after cessation of treatment.

Dr. Roizin and Drs. Nishikawa (Keio Gijuku University, Tokyo, Japan), Koizumi (Chiba University, Chiba Japan), Iyengar (Neurotoxicologic Research Unit, Psychiatric Institute and the Bronx State Hospital), and Mrs. Keasian and Mikeman, on the basis of electron microscope and histochemical examinations of the CNS in experimental animals and human biopsies, have suggested that the "multivesicular body" is a component of an intracellular morphokinetic cannalicular-organelle system (IMCOS) which participates in the metabolic transport and communication mechanisms at the ultracellular level of organization.

An interdisciplinary research project on prenatal effects of hallucinogens is being conducted by Drs. Roizin, Kaufman, Alexander, and Drs. Gold, Lawler and Miles of the Neurotoxicologic Research Unit, Psychiatric Institute and the Bronx State Hospital.

Drs. Lawler, Uneno and Roizin have noted some quantitative and qualitative histochemical changes in the acetyl cholinesterase activity in certain regions of the rat brain following the administration of compazine and mescaline.

Also, Drs. Roizin, Kaufman and Edgar M. Housepian (Neurological Surgery) and Dr. Ralph N. Wharton (Department of Psychiatric Research) have, through histochemical and electron microscopic studies of a brain biopsy of a presenile psychosis consistent with familial Pick's disease, made the original observation of intraneuronal degeneration associated with oxidative-reduction and hydrolytic enzyme changes and also ultrastructural alterations of the synapses. These investigations indicate the evidence of the intercellular communication mechanisms at the synaptic level.

Drs. Roizin, William Caveness (Neurological Institute and NINDB-NIH), Schade (Central Institute for Brain Research, Amsterdam, Netherlands) and Drs. Carsten (Brookhaven National Laboratories) and Machek are exploring some pathogenic mechanisms of the delayed X-irradiation effects in the monkey cerebral cortex with correlated electrophysiologic, neuropathologic and ultrastructural (qualitative and quantitative) procedures.

In the area of medical genetics, a number of studies were in progress having to do with the transmission of schizophrenia in families including

the study of mating and fertility patterns of schizophrenia conducted by Drs. L. Erlenmeyer-Kimling and John D. Rainer.

They are also doing further work in schizophrenia centered on the study of children of schizophrenic parents using various psychological and psychophysiological test batteries.

In the area of aging, Dr. Lissy F. Jarvik, together with Drs. T. Kato, P. Yarden and Mrs. June Blum, reported on genetic changes.

Drs. Hildegard Marcq, Jarvik and Rainer, have studied lymphocyte growth *in vitro* for two groups of schizophrenics, one with a high nailfold plexus score and one with a low score, as well as for normal subjects.

Drs. Donald Dillon and Crawford Clark continued their experimental study of pain perception with the aim of perfecting methods for distinguishing between the purely sensory threshold for experimental pain as a sensation (physiological threshold) and the subject's criteria for classifying a sensory experience as painful (psychological threshold) and for reporting pain.

Dr. Carr, in cooperation with Drs. Schoenberg Peretz and Dr. Austin Kutscher (Dental and Oral Surgery) are collaborating on a series of projects related to loss and grief. A survey has been conducted of physicians and widow-widowers on attitudes pertaining to the management of grief and mourning states in family members following the death of a patient. A further study, in collaboration with Miss Helen Pettit (Nursing) and Chaplain Robert Reeves, Jr., has been directed toward the education of physicians, nurses, and chaplains in preparing for dealing with the problem of terminal care.

Drs. Thetford and Schucman are applying the personality assessment system to the study of migraine and ulcerative colitis patients.

Dr. Donald Hutchings is studying the effect of prenatal, maternal stress on the emotional behavior and development of the offspring in the rat. Dr. Carol Schulman (under the sponsorship of Dr. Rutschmann) is studying the action of the heat in the premature infant with a low risk for brain damage and subsequent severe mental retardation and neonates with known neurological impairment.

Drs. Gibbon and Hunt have continued studies on aversively controlled behavior in the rat. Further, Dr. Gibbon has developed a comprehensive mathematical model to deal with the effects of punishment and painful stimuli on behavior.

Dr. Ernest M. Gruenberg studied the personaeological, diagnostic and hospitalization character

tics associated with long-stay patients in mental hospitals.

Dr. Gruenberg also reports that data from the Dutchess County Field Station indicates that at any moment in time there are about 160 cases of severe social breakdown syndrome per 100,000 population aged 16-65.

The Geel Foster Care Project, jointly sponsored by the department and the University of Louvain, Belgium, is under the direction of Dr. Leo Srole.

A longitudinal study of newly placed patients in foster families is being pretested to investigate the nature, direction and magnitude of changes in social functioning. Demographic analyses are being made of the different types of foster and non-foster families. Interviews with current foster mothers are being conducted in order to explore the genealogical history and the sociological and psychological motivations of foster care families. Dr. Srole reports that in his social science investigations data from the Midtown Manhattan Mental Health Study hypotheses are being tested which will explore social and psychological dysfunctions in life experience as they relate to mental health. Explorations of the Midtown symptom items have led to intensive analyses of two variables: sleep disturbance and smoking behavior. Each of these has been investigated separately for their relationships to a number of sociological and psychological corollaries. A refined occupational code has been developed to facilitate the investigation of relationships between occupation and aspiration, and to explore concepts of mobility and social class.

Dr. Bruce Dohrenwend has continued studies of social factors in relation to psychiatric disorders in collaboration with Drs. Edwin Chin-Shong, DeWitt L. Crandell, Gladys Egri and Yorihiko Kumaseka. A new study focussing on relations of psychiatric symptoms to physical illness has been started in the unit with Dr. Crandell as principal investigator. Dr. Chin-Shong completed an analysis of attitudinal rejection of the mentally ill that has formed the basis of his doctoral dissertation in the Department of Sociology at Columbia.

Dr. Nathan S. Kline, Director of Research at Rockland State Hospital, reports a notable increase in work with the establishment of the computerized interstate psychiatric patient data system. To implement this new program, an entire new computer wing was recently completed at the Research Unit at Rockland State Hospital and there has been a staff increase of almost fifty employees.

Dr. William Goldfarb and his associates have completed an accumulation of longitudinal data on

development of 100 schizophrenic children, and this data is currently being analyzed. They are preparing tools for the intensive evaluation of communication in schizophrenic children and for the families. Plans are being completed for the study of known cases of cerebral palsy to clarify the incidence of psychosis and the part played by social factors in psychotic reactions in children with known brain damage.

Dr. Herbert Spiegel has continued his studies on hypnotizability.

Service to Patients

The department has extended its psychiatric liaison service in the Vanderbilt Clinic. Currently serving the psychiatric liaison service are Dr. Stanley Coen in the diabetes clinic in conjunction with Dr. Lothar Gidro-Frank who is interested in diabetes in adolescence; Dr. Richard Druss in the ulcerative colitis clinic; Drs. Burton Lerner and Florence Liben are working in conjunction with the obstetrics and gynecology clinics; Dr. Alexander Levay is continuing his investigation of psychological disorders in patients with Addison Disease; Dr. Lloyd Hamilton, who is clinical director of psychiatry at Hillside Hospital, continues to work in the cardiovascular clinic; and, Dr. Eugene Martin, working in the arthritis clinic has replaced Dr. David Peretz in the gastrointestinal clinic.

As a result of the initial success in the management of selected psychiatric patients in their homes through the affiliation of the Visiting Nurse Service of New York, a new psychiatric nurse, Miss Mary Anne Giese, has been added to assist Miss Bette Holloway, the clinic nurse. In order for the nurse to work effectively, it is necessary to provide supervision and consultations by an attending psychiatrist throughout the work day. In the mornings, Dr. Paul Singer is available and in the afternoon, Dr. Winslow Hunt and Dr. Jerome Steiner assist through the psychiatric distributing clinic.

Drs. John D. Rainer and Kenneth Z. Altshuler directed the expanded clinical services for the deaf. They received over 500 clinical visits by patients deaf since birth or early childhood. This therapeutic service arranges a diagnostic and preventive schedule at the level of the school for the deaf and early family environment, a therapeutic inpatient and outpatient treatment and rehabilitation, halfway house and after-care programs.

Genetic counseling services for couples and families with a variety of medical problems was supplemented by cytogenetic investigation in cases of possible chromosomal defect.

Acknowledgments

The members of the department are deeply grateful for the support of their research endeavors during the past year to the United States Department of Health, Education and Welfare, National Institute of Mental Health, Child and Human Development, Division of Vocational Rehabilitation, The New York State Department of Mental Hygiene, Foundations' Fund for Research in Psychiatry, Mil-

bank Memorial Fund, The Grant Foundation Inc., W. R. Grace Foundation, Adele R. Levy Fund, Inc., Ayerst Laboratories, Ives Laboratories, Hoffman La Roche Laboratories, Wallace Laboratories, The Schering Corporation, The American Foundation for the Family Care of the Mentally Ill, and the American Jewish Committee, New York City Community Mental Health Board, and the Josiah Macy, Jr. Foundation.

Public Health and Administrative Medicine

RAY E. TRUSSELL

DeLamar Professor and Chairman of the Department

Dr. Ray E. Trussell resigned at the end of this year to become General Director of the Beth Israel Medical Center. Dr. Trussell has been Director of the School since 1955. During his more than thirteen years at Columbia, the School of Public Health and Administrative Medicine has increased its student enrollment substantially. New programs in community and social psychiatry, nutrition sciences, medical care administration, sociomedical sciences, and social services have been accorded divisional or institute status. Degree programs at the masters level have been developed in administrative medicine, epidemiology, community and social psychiatry, and public health nutrition. A Ph.D. program in Administrative Medicine functions through the School under the auspices of the Graduate Faculties. Joint programs with the Department of Nursing, the Department of Psychiatry, and the School of Architecture have set a now well-developed pattern for intra-University cooperation in preparing much needed personnel for important positions. The School has the largest and most extensive program of continuation education of its kind in the country.

Dr. Trussell served as Commissioner of Hospitals of New York City from 1961-1965. He is a member of the State Hospital Review and Planning Council and of the Health Insurance Benefits Advisory Council which advises on Medicare policy and regulations. Dr. Trussell has directed a series

of large-scale studies of health services, health care financing, and organization and administration of medical care programs. Currently, he is chairman of the committee of the Health Insurance Benefits Advisory Council which is preparing the first report on Medicare required annually by the Congress.

Dr. Milton C. Maloney continued as Associate Director and as Coordinator for contract administration for the Harlem Hospital Center affiliation. He has also assumed responsibility for the administration for an enlarged affiliation contract for the professional staffing of the Francis Delafield Hospital. He continues to share in the direction of the National Medicaid Evaluation Study and of a similar study evaluating the effect of Medicare on utilization and costs of medical care.

Dr. Beatrice Mintz, Assistant Professor of Administrative Medicine, assisted by Miss Kathleen Zawadzki, continues to direct the expanding activities of the Research Data Archives.

Two new divisions were created in the department this year: the Division of Sociomedical Sciences and the Division of Social Sciences. The former is headed by Dr. Jack Elinson, and the latter by Dr. Maurice Russell.

Division of Biostatistics

Dr. Mindel Sheps and Dr. Ruth Z. Gold, have resigned from the division.

Dr. John W. Fertig served as statistical consultant in Latin America for the World Health Organization. He participated in the Conference of Clinical Testing of Cariostatic Agents as a member of the Task Force on Design and Analysis. Dr. Fertig serves as a member of the Environmental Health Sciences Training Committee of the National Institutes of Health. Dr. Sheps served as an advisor to the World Health Organization and is a member of the Advisory Committee of Planned Parenthood and of the Committee on Population Statistics of the Population Association of America. Dr. Andre Varma served as advisor to the Health Training Program for medical and dental students of the New York City Health Department.

Dr. Agnes Berger has continued her studies with Dr. Gold on multiple comparisons of survival times. Dr. Varma has been closely associated with the work of Dr. John J. Sciarra (Obstetrics and Gynecology) on lactogen and gonadotropin assays. Dr. Sheps has continued her research on quantitative approaches to natality and family models. Dr. Fertig and Dr. Neal W. Chilton continue their work on statistical methods in dental research.

Division of Community and Social Psychiatry

The interdepartmental training programs in community and social psychiatry were carried out in 1968, within the Division of Community and Social Psychiatry, along the lines that have been reported on in previous years.

Dr. Samuel Bullock joined the faculty as of July 1, 1968 as Assistant Clinical Professor of Psychiatry. He shares his time equally between this division and the community psychiatry program of Harlem Hospital's Department of Psychiatry.

Dr. Archie R. Foley has been appointed Chairman, Department of Psychiatry, The Catholic Medical Center of Brooklyn and Queens. Dr. Foley will retain his appointment as Assistant Clinical Professor of Psychiatry.

Dr. Florence G. Liben has been appointed Coordinator of Training for the division.

Marjorie H. Frank was appointed Instructor in Administrative Medicine. Her activities are related to the planning of mental health and health center facilities as well as to teaching in the division.

Drs. Hanna E. Kapit and Michael Beldoch, have joined the faculty of the division as Assistants in Psychiatry. They are working in the division's Family Development Unit on a family planning action research project, headed by Dr. Lerner.

The division now awards the degree of Master

of Science in community and social psychiatry.

At the invitation of the Asociacion Argentina Psiquiatria Social, Dr. Viola W. Bernard conducted a series of lectures and seminars to professional groups in Buenos Aires, Argentina.

Drs. Flapan and Bernard have continued the research program of the Family Development Research Unit. A study of childbearing motivations and conflicts as related to family planning behavior was designed and initiated by Dr. Flapan during the year. Related to this investigation is a family planning action research program, directed by Dr. Lerner with the assistance of Drs. Beldoch and Kapit. Dr. Ann Miller, with Drs. Flapan and Bernard, has undertaken some preliminary work for studying relationships between these women's maternal behavior and their childbearing motives and conflicts as studied prior to conception.

Dr. DeWitt Crandell is studying the social factors and psychiatric and physical symptoms.

Dr. Leo Srole continues as Director of the Ghel Foster Care Project conducted jointly with the University of Louvain.

Division of Environmental Health

An elective course on environmental health in hospitals and other medical care facilities was offered for the first time by Dr. Alvin R. Jacobson with the assistance of a number of lecturers from this field of public health.

Dr. Jacobson was appointed Director of Environmental Health at Harlem Hospital as part of the preventive medicine program. This program will provide training facilities for environmental health students at the graduate level working towards the Master of Public Health degree as well as the Master of Science in Environmental Health.

Dr. Jacobson was elected President of a newly formed organization, The Association for the Advancement of Environmental Health in Medical Care Facilities.

Division of Epidemiology

The division continued its teaching in the programs for the Master of Public Health and associated courses, and for the programs in hospital administration, the School of Nursing, and second year medical students. A Master of Science degree in Epidemiology has been approved. The weekly epidemiology colloquium for faculty and advanced students was continued as an established part of the division program.

Dr. Frank W. Mount, formerly Deputy Chief o

the Chronic Respiratory Disease Program, National Center of Chronic Diseases and now coordinator of Field Research of the Institute of Human Reproduction, was appointed Research Associate in the division.

Dr. Vincent Guinee, presently Director of the Bureau of Preventive Diseases, has been appointed Adjunct Assistant Professor of Epidemiology.

Miss Sarah Turner has resigned her appointment as Instructor, and Dr. Guinee will take over the courses in epidemiology conducted by her in the School of Nursing.

Dr. Daniel Pridan, Lecturer in the Department of Preventive Medicine, Hebrew University School of Medicine, spent three months as a visiting member of the division. He taught in the summer epidemiology program for medical students conducted by the New York City Health Department.

Dr. Charles Cherubin joined the Division of Epidemiology in January. Dr. Cherubin is a full-time epidemiologist at Harlem Hospital and consultant in infectious diseases in the Department of Medicine in the Harlem Hospital Center.

Dr. Morton Schweitzer spent a sabbatical year as Visiting Associate Professor, School of Public Health, University of California at Los Angeles, and Visiting Associate Professor, Department of Preventive Medicine, University of Washington at Seattle.

Dr. Zena Stein has been appointed Director of an Epidemiology Research Unit set up by the New York State Department of Mental Hygiene in the Division of Epidemiology; its chief object is to develop research in mental retardation.

Dr. Mervyn Susser, chairman of the division, further widened the range of teaching in epidemiology and conducted the introductory course for second-year medical students in preventive medicine. He visited the Netherlands, in particular, the Universities of Leiden and Tilburg, in order to explore the feasibility of a study of the long-term effects on infants in utero of the Dutch famine of 1944-45.

Research

The following studies are in progress: evaluation of the methadone maintenance program for treatment of heroin addiction, and evaluation of the addiction service agencies narcotic treatment program, conducted by Dr. Frances Gearing; deaths from coronary heart disease in Washington Heights, conducted by Drs. Lawrence Bergner, Gearing, and Schweitzer; epidemiologic studies of Parkinson's disease conducted by Drs. Gearing and Schweitzer

with Drs. Melvin Yahr and Roger C. Duvoisin (Neurology); family study of primary hypertension conducted by Drs. Gearing and Schweitzer with Dr. George Perera (Medicine); relationship of smoking and Parkinson's disease, a preliminary study conducted by Drs. Bergner, Gearing, and Schweitzer, with Dr. Duvoisin.

The Air Pollution Epidemiologic Research Unit, directed by Dr. Robert Albrecht, is conducting research on the effect of air pollution on mortality by cause in New York State; the usefulness of emergency room visits in continued morbidity surveillance in relation to air pollution.

The Psychiatric Epidemiology Research Unit, directed by Dr. Ernest Gruenberg, is currently conducting research on the following: in-patient care of Washington Heights residents; a two-year follow-up of acute schizophrenic decompensation in Washington Heights, and a follow-up of a 10% sample of admissions analysis of Manhattan patients becoming long-stay; a study of defects in the recognition of equivalent sensory stimuli patterns in adults with mental disorder; epidemiology of suicide in Canada; follow-up of criminal narcotic addiction in British Columbia; incidence of social breakdown syndrome in Dutchess County.

The New York State Epidemiology Research Unit, under the direction of Dr. Zena Stein and with the participation of Dr. Susser, is developing a program of research into the epidemiology of mental retardation. Projects have been prepared around three fields of interest: the effects of maternal nutrition during pregnancy on mental development; the relation between duration of gestation, birthweight, and mental development; the role of maternal hyperphenylalanemia in mental retardation. Drs. Stein and Susser continue their studies of mental illness in the English city of Salford.

A study of the effectiveness of procedures for bacteriologic sampling of the hospital environment is being conducted by Dr. Anna Gelman with Mr. J. B. Cropper of the New York City Health Department; and a study of addiction was initiated by Dr. Gelman and Dr. Richman.

Division of Medical Care Administration

Dr. Milton C. Maloney, Associate Director and Assistant Professor of Administrative Medicine, has been appointed Acting Chairman of the division.

Miss Margaret Lindsay has been appointed Research Associate. Dr. Clement C. Clay was on sabbatical leave from February 1 through July 31, 1968, and served as a Temporary Consultant for the Pan American Health Organization in El Centro

Latinamericano de Administracion Medica in Buenos Aires, Argentina, for five months. With the cooperation of our School, the Center was established under the auspices of the Pan American Health Organization, the Government of Argentina, and the University of Buenos Aires to educate administrative personnel for the health care field.

Mr. Frank van Dyke continued his study of hospital-based specialists for the Social Security Administration; his study of the patterns of medical care expenditure for the United States Public Health Service; and a study of the administration of the health and medical program for civilian dependents and retirees for the Department of Defense. He began a study of home health services in the New York metropolitan area for the Associated Hospital Service of New York, the Health Research Council of the City of New York, and the Social Security Administration.

Robert R. Lovejoy is making a study of hospital mergers in the New England area with the support of a grant from the Alfred P. Sloan Foundation.

Institute of Nutrition Sciences

Dr. Theodore B. Van Itallie is on sabbatical leave as Visiting Professor of Medicine at American University of Beirut. Dr. Barbara Underwood was promoted to Assistant Professor of Public Health Nutrition. Dr. Frederic W. Nordsiek was appointed Adjunct Professor of Public Health Nutrition. Dr. Saroj Devi was appointed as a Post-doctoral Research Fellow. Dr. Mary Bal resigned.

Dr. W. H. Sebrell, Jr., was elected as a Fellow of the American Institute of Nutrition and received the Conrad A. Elvehjem Award for Outstanding Service in Public Health Nutrition. He also received the Distinguished Service Award of the Food and Nutrition Council of Greater New York.

Changes in curriculum: a program in food science designed to grant a graduate degree to students especially interested in this area of nutrition was inaugurated.

The research program at the Columbia University-St. Luke's Nutrition and Metabolic Research Center has continued to be concerned primarily with human nutrition studies involving obesity, lipid and carbohydrate metabolism. These studies are concerned primarily with the control of appetite in the obese individual, the deposition and metabolism of odd-numbered chain-length fatty acids (C-9, C-11). Studies have also continued on the use of medium chain triglycerides in malabsorption syndrome.

Studies at the William Black facility are concerned with the mechanism of the absorption of

the fat-soluble vitamin and the nature of the defect in the absorption of these vitamins in children with cystic fibrosis; studies of the effect of microwave heating on the nutritive value of frozen prepared foods has been continued and extended to include riboflavin as well as thiamine; and a study of the effect of the addition of fish protein concentrate in lieu of nonfat dry milk in the high protein cereal mixture (Laubina) developed at American University of Beirut, has been started. The program at the Nutrition Research Center at American University of Beirut has continued to deal primarily with effects of protein calorie malnutrition and the development of a suitable high protein feeding mixture for the Middle East.

Division of Occupational Medicine

Dr. Leonard J. Goldwater continued on sabbatical leave, writing a monograph on mercury and consulting with the Division of Community Medicine at Duke University. Dr. Morris M. Joselow was the recipient of a Fellowship from the World Health Organization and visited centers of research in occupational health in various countries in Europe.

Work has continued on the physiological effects associated with mercury absorption, as reflected in biochemical alterations in body fluids, mostly blood and urine. Research demonstration program in the role of the hospital as a center for small industry occupational health services is being continued at Brookdale Hospital Center, Brooklyn, New York, with Dr. A. Walter Hoover as the principal investigator.

Division of Public Health Education

Dr. George Rosen has accepted the position of Professor of the History of Medicine at the Yale University School of Medicine, and will resign from his present post at the end of the current academic year. He gave the Hideyo Noguchi Lecture at the Johns Hopkins University School of Medicine. His subject was "Enthusiasm - 'A Dark Lanthorn of the Spirit.'

Division of Public Health Practice

Dr. Samuel Wishik, Director of the Division for Program Development and Evaluation of the International Institute for the Study of Human Reproduction, was appointed Professor of Public Health Practice.

Dr. Herman E. Hilleboe was the 1968 recipient of the Sedgwick Memorial Medal, one of the highest honors in public health, at the annual meeting

of the American Public Health Association. He was elected to the Board of Scientific Directors of the American Health Foundation of New York City; and was appointed a special consultant to the National Center for Radiological Health of the United States Public Health Service.

Activities under the development phase of the Regional Maternal and Child Health Research Program were concluded in July, 1968, with the completion by Dr. Betty Simons and Dr. Elinor Downs of their preliminary studies on patterns of Adolescent Medical Care in New York City and on child abuse legislation.

During the year Dr. Eric Josephson and Mrs. Ann Brunswick continued their analysis of data collected in a 1967 pilot study of adolescent health in Washington Heights. This study has provided the basis for a large survey of adolescent health, which is now underway in Central Harlem.

A three-year study by Dr. Elinor Downs on the health and medical care of mothers and children in Washington Heights has been concluded.

Dr. Herman E. Hilleboe and Dr. William Thomas, Jr. made a study of the teaching of health administration at the School of Public Health of the University of Buenos Aires, Argentina, at the request of the Pan American Health Organization. Dr. William Thomas made a study in cooperation with his staff of Rockland Community College (New York) of managerial efficiency and manpower use in selected health care facilities in Rockland County.

Miss Gloria Dammann performed such special studies on in-patients laboratory services in Harlem Hospital.

Division of Sociomedical Sciences

The division was formed in May, 1968, for the purpose of bringing together social scientists, who were doing research and teaching in the area of health services systems, and health professionals, who were interested in collaborating with social scientists in their approach to problems of the organization and delivery of community health services. The division is currently composed of seven faculty members of professorial rank, ten research associates, and supporting staff.

Dr. Jack Elinson served as a short-term consultant to the Pan American Health Organization for the purpose of stimulating research activity in the Centro Latino Americano de Administracion Medica in Buenos Aires.

The division is responsible for the Ph.D. program with an emphasis on a social science approach to

community health problems. Dr. Mata N. Nikias was the first recipient of this degree at Columbia University. She received the 1968 Kulp Award given by the American Risk and Insurance Association for the book "Insured Dental Care" (co-authored with Helen Avnet).

Dr. Howard Kelman resigned as of October 31, 1968, to accept a position as Professor of Preventive Medicine at the New York Medical College.

Members of the division are engaged in studies of physicians' attitudes toward organization of health care, adolescent health and medical care needs in Harlem; the utilization of dental care, human fertility, a nation-wide evaluation of Medicaid and the Washington Heights Community Master Sample Survey.

Members of the division at Harlem Hospital Center continued to work in the Patient Care and Program Evaluation Service.

Studies which were completed during the year included an exploratory study on the incidence of abortions in an urban community. This study was carried out in collaboration with the Population Council.

A monograph on the first seven years of work of the Washington Heights Master Sample Survey summarizing some 40 scientific papers was prepared for publication as a supplement to the *Milbank Memorial Fund Quarterly*.

Toward the end of the year, a new study was undertaken to assess the impact of the state mental hospital strike in New York City on the public's image of mental health services. Available for comparison was a city-wide comprehensive baseline study which had been done five years earlier. The preparation of a research proposal for a study of clinical pharmacy was undertaken by John Colombotos in collaboration with Dean Joseph L. Kanig and Assistant Dean S. Gross of the College of Pharmaceutical Sciences. A research proposal for a study of alcoholism mortality and survey-identified alcoholics was prepared and submitted by Paul Haberman.

Division of Tropical Medicine

The Division of Tropical Medicine in addition to giving courses for the medical students and public health students has cooperated in the educational programs of the departments of nursing, dermatology, pathology, medicine, neurology, pediatrics, surgery, and anthropology.

Recently, the Division of Tropical Medicine, in cooperation with Presbyterian Hospital, added a

serological diagnostic service for toxoplasmosis, amebiasis, trichinosis, and echinococcosis, to their stool and blood examination service for parasitic diseases.

Dr. Harold Brown has raised funds to build a duplex, "Columbia House," at the Phebe Mission Hospital in Liberia, which will accommodate P&S fourth-year medical students during their elective, Medicine in the Tropics. Dr. Brown served as the China Medical Board's consultant in Seoul, Korea, in the building planning program of the University's School of Public Health. He also served as consultant for the United States State Department's eastern Asia tropical medicine development program in Bangkok, Thailand. He was the guest of the Academy of Medicine of Mexico and discussed the chemotherapy of parasitic infections at their meeting. Dr. Brown serves as chairman of the National Research Council's study section on chemotherapeutic agents for parasitic diseases. This committee is responsible for the testing and assessment of drug efficacy for the Food and Drug Administration.

Dr. Roger Williams serves as consultant to WHO Filariasis Research Unit in Rangoon, Burma. He also serves as a Corporation member of the Bermuda Biological Station for Research.

Research

Dr. T. Y. Lee, Director of Taipei City Health Bureau, and Dr. Brown have completed their five-year study on the epidemiology of tuberculosis in Taiwan. Dr. John D. Frame is continuing his studies on the epidemiology of infectious hepatitis among several thousand missionaries, from many countries, who are under his medical supervision. Drs. Frame and Brown are preparing a study of the effects of long-time chloroquine malaria prophylaxis upon the sight of missionaries and their children.

Dr. Louis H. Miller and graduate students continue the study of the effects of changes in the red cell during malaria on deep vascular schizogony and the pathophysiology of this infection. Dr. Ashton C. Cuckler continues his extensive chemotherapeutic studies on human and domestic animal parasites. Dr. Williams is studying the mode of action of filaricidal drugs. Dr. Howard B. Shookhoff continues his assessment of a number of chemotherapeutic agents against parasites found in the New York population. Dr. Kathleen L. Hussey is completing her studies on the microsporidian parasites of larval trematodes.

Program of Continuation Education

Administrative Medicine Section

Major efforts in the administrative medicine section of the program of continuation education paralleled major health concerns in the nation. Two significant shifts in emphasis are reflected in the program during 1968. The first is that of conducting educational programs for individuals who have a direct community interest in health care, but are not providers. The emphasis was primarily on the underprivileged and the minority groups. The second change was a doubling of the efforts to educate and upgrade administrators of nursing home type facilities.

Through a special request received from the United States Department of State, a special course of six-months' duration was conducted for six physicians from the Ministry of Health of Thailand. This course followed the usual programming in the international section of the program.

At the request of The National Urban League and with the cooperation of the Rockefeller Foundation, a one-week seminar on medical care was presented for representatives of The National Urban League, Inc., The National Association for the Advancement of Colored People, and several related organizations. The purpose of the program was to acquaint community leaders with the elements of medical care and methods for more effective distribution of medical care, especially in ghetto areas.

During its fourth year of affiliation with the Hospital Research and Educational Trust, the Columbia University Center for Hospital Continuing Education once again offered three major courses on a nation-wide basis: management development (for assistant administrators and department heads of Health Care Facilities), hospital planning and development (for administrative personnel with specific responsibility for planning facilities and services in hospitals and other health care facilities) and the ninth annual course for directors of volunteers in health care.

Mr. Harold Baumgarten spent one month on assignment at the University of Buenos Aires, Argentina, developing continuation education program in the newly developed Latin American Center for Administrative Medicine. Mr. Baumgarten lectured at Sao Paulo University, Brazil; Florida Atlantic University; Central State University, Ohio; Heidelberg University; and at George Washington University. In addition, Mr. Baumgarten received an appointment as Chairman of the National Advisory Council for Nursing Home Administration, United

States Department of Health, Education, and Welfare.

Public Health Section

Dr. Eric R. Osterberg, the Director of the Program, assisted by Mr. Francis C. Lindaman, conducted a series of 27 short courses and institutes during the past year intended to update the practicing public health professional in the newer trends in public health. Current trends in community health planning and in medical care are reflected in the course content of these courses. A total of 810 professionals of all health disciplines attended these courses.

While the demand for refresher material continued and several previously offered courses were held to meet the needs of newly appointed health workers, a large portion of the activities of the program related to the recent trends in health planning and administration. These courses were directed to a multidiscipline audience in official and voluntary health agencies, in hospitals and long-term health care institutions, health and welfare planning councils, and others with increasing interest in the health field.

To meet the needs of part-time public health physicians and dentists, as well as medical directors of welfare programs, in public health, a three-week course in public health was developed. This course provides a broad introduction and orientation to public health, with emphasis on the practical aspects of interest to part-time professionals.

The impact of Medicare and Medicaid and the role of official agencies in inspection, certification,

and consultation in medical care institutions necessitated the developing of a special one-week course on the control of the environmental factors in hospitals and long-term care facilities. A follow-up course of five-weeks' duration is planned.

The impact of population growth was reflected in two courses conducted in cooperation with the voluntary health agencies intimately concerned with this problem. One of these, a five-week program co-sponsored by the Maternity Association, has become a semi-annual offering of the program.

Donors

Major donors to the research program were the Alfred P. Sloan Foundation; Associated Hospital Service of New York; Burroughs Wellcome; Campbell Soup Company; China Medical Board; Department of Defense; Department of Health, Education, and Welfare (Children's Bureau, National Institutes of Health, United States Public Health Service, and the Welfare Administration); Foundations Fund for Research in Psychiatry; Grace Foundation; Health Research Council of the City of New York; IBM Corporation; Licensed Beverage Industries; Merck, Sharp and Dohme Company; National Cystic Fibrosis Research Foundation; New York State Department of Health; New York State Narcotic Addiction Control Commission; Nutrition Foundation; Raytheon Research; Rockefeller Foundation; St. Luke's Hospital; Social Security Administration; Teamsters' Joint Council #16 and Management Hospitalization Trust Fund; Three M Corporation; Whitehall Foundation and the Williams-Waterman Fund.

Radiology

WILLIAM B. SEAMAN

Professor and Chairman of the Department · Director of Service

The manpower shortage in radiology, emphasized in last year's report, continues to be the most pressing problem. During the past year the shortage of x-ray technicians reached a critical level and seriously interfered with the prompt delivery of good radiologic service. Authorization for a school of x-ray technology under the aegis of Presbyterian Hospital has been granted and plans are under way for a beginning class early in 1969. It is hoped that this will keep us adequately supplied with x-ray technicians.

At the professional level, the national shortage of radiologists is even more acute than it was last year, due to an increasing demand. The fellowship program, financed by the Public Health Service through the Institute of General Medical Sciences, has added eight fellows to our training program and should materially assist in solving the professional manpower shortage at the local level.

Staff Changes

Dr. Arnold Schwartz resigned to take a position at the Episcopal Hospital in Philadelphia. Dr. Robert Sagerman accepted a position as Professor of Radiology and Chief of Radiotherapy at the State University of New York in Syracuse. Dr. Joseph Bordiuk of the Cardiovascular Laboratory became the Chief of Pediatric Cardiology at St. Vincent's Hospital in New York. Drs. Matthew Higgins, Leroy Kotzen and Richard Stevens, and Nathan Geffen resigned to enter private practice.

The staff was strengthened by the return of Dr.

Donald King, a former resident, who completed his tour of duty with the Armed Forces. Drs. Robert Waldron, Peter Gevas, and Thane Asch also became members of the attending staff in diagnosis.

Research Activities

Division of Diagnostic Radiology

Dr. Kent Ellis continues his analysis of the angiographic features of endocardial cushion defects with special attention to changes following corrective surgery with Dr. Sylvia Griffiths (Pediatrics), and Dr. James R. Malm (Surgery). With Dr. John D. Burris (Medicine), he continues to study the roentgenographic, angiographic and catheterization findings in constrictive pericarditis. Dr. Sidney Blumenthal (Pediatrics), Dr. Malm, and Dr. Kent Ellis are studying the radiographic manifestations and natural history of ventricular septal defects with aortic regurgitation. The roentgenographic features of hereditary angioneurotic edema involving the intestine has been studied with Dr. David J. McConnell (Medicine). He continues his work on the correlations of cardiovascular sounds with cineradiographic findings with Dr. William M. Rogers (Anatomy). Various forms of left ventricular outflow tract obstructions are being analyzed roentgenographically by Dr. Ellis.

The study of the effects of radiographic contrast material on the pancreas is being continued by Dr. Robert Waldron. With Dr. Sarah Luse (Anatomy), Dr. Waldron is investigating a retrograde pancreatic pathway, utilizing roentgenographic and

electron microscopic techniques. A review of operative and T-tube cholangiograms for evaluation of pancreatic reflux is also under way.

Dr. Guy Potter is continuing his study of correcting the identity of structures of the human head with their radiological counterparts using hypocycloidal tomography. The significance of variations associated with neoplastic, inflammatory and congenital abnormalities will be evaluated. He is also studying anatomy and pathology of the optic canal.

The early diagnostic lymphangiographic changes in lymphoma are being studied by Dr. Harvey Leicht.

Dr. Ira E. Kanter is evaluating the effect of vasodilators in peripheral arteriography and in the visualization of intra-abdominal tumors. With Dr. Paul Cannon (Medicine) a study of renal cortical and medullary blood flow, particularly in hypertensive patients is being carried out, using selective renal artery injections of Xenon.

Drs. William B. Seaman with Herbert Wollowick is studying the physiology of antral motor function in dogs by selective excision of muscle bands and cine studies of gastric motility. Our experience with prolapse of the gastric mucosa into anastomotic jejunal loop, a new entity, is being evaluated by Dr. Seaman. Dr. Seaman also continues his studies of abnormal pharyngeal and esophageal function using cine radiographic techniques.

The blood levels of contrast material after infusion pyelography has been studied by Dr. Joshua A. Becker in patients with varying degrees of renal failure. He has also demonstrated that repeated administration of contrast material result in fairly high blood levels because of poor excretion by the kidney. A cooperative program has been set up with the New Haven Hospital and the Peter Bent Brigham Hospital to further evaluate patients in renal failure and with liver disease.

Drs. David H. Baker and Walter E. Berdon are reviewing methods of detecting abdominal tumors in children using both conventional and special studies in an attempt to assess the relative value of each procedure. With the members of the Department of Surgery, they evaluated the role of radiographic techniques in patients with imperforate anus. The prognosis of patients with diaphragmatic hernia was studied in relationship to the degree of pulmonary development. They also demonstrated the value of the prone film in abdominal radiography. Children with ectopic ureterocele were reviewed as well as patients with azygous continuation of the inferior vena cava. They also studied the anomaly of compression of the trachea by the

innominate artery in infants and demonstrated that the diagnosis could usually be easily made on the lateral plain film of the chest. They had an opportunity to study patients who were long term survivors of abdominal radiation. They also studied the Tam-Horsfall mucoprotein which, although normally present in the urine, is increased in various diseased states. This protein has been present in very large amounts in some normal children with palpable kidneys at birth who exhibited delayed excretion of contrast material following intravenous pyelography. It seems that this protein actually precipitates with various radiopaque contrast material and might be the explanation of some of the changes seen in protein disorders which have been associated with lower nephron nephrosis. The study to date has been conducted *in vitro* with test tube dilutions and also *in vivo* with dichromate poisoned rats.

Dr. Thane Asch is reviewing our experience with scar carcinoma of the lung and the coincidence of carcinoma of the lung and scleroderma.

Dr. Josephine Wells with Dr. Harold Jacox is working on the study of the bony changes resulting from radiation in the region of the shoulder.

Dr. Frieda Feldman with Dr. David Habif (Surgery) and Dr. Clay Frick and Dr. Raymond Vande Wiele (Obstetrics and Gynecology) are investigating peritoneal lymphangiography.

Dr. Ralph Schlaeger with Drs. Orestes Manousos (Medicine) and George Hyman (Medicine) completed a study of esophageal varices associated with metastatic neoplasms of the liver. With Drs. Harold Harvey and Harold G. Barker, he completed a physiologic study of emptying of the gastric pouch in the early post-gastrectomy period.

Dr. Sadek Hilal is investigating the polymeric derivatives of contrast media and has developed a new water soluble polymer suitable for injection in the subarachnoid space. In collaboration with Dr. Louis B. Lambert and W. F. Konig, research on image processing using the laser light for the purpose of detail enhancement and for the partial compensation for the penumbra effect is being conducted. With Mr. Jack Driller of the Riverside Research Institute and Dr. Wolfgang J. Michelson (Neurological Surgery), he is continuing research on the magnetic guided catheter for the purpose of exploring small vessels. This magnetic catheter was used on patients for the first time this year with the tip of the catheter positioned in the middle cerebral artery from a carotid artery entry. This is the first time this feat has been achieved. He continues his investigation of regional cerebral blood

flow using a radiographic technique in various tumors and arterio-venous malformations. With Dr. Hagop Tookoian and Dr. Ernest H. Wood, he is studying aqueductal displacement by tumors of the posterior cranial fossa. With Gail Solomon and Drs. Sidney Carter and Arnold Gold (Pediatric Neurology) a study of hemiplegia in childhood is going on.

Dr. Wood continues his studies of clinical thermography for the diagnosis of extracranial cerebral vascular occlusive disease. He and Dr. Hervey Segall are currently assessing the limitations of the linear trace "Therma-Corder." This device will be used in the nationwide comprehensive community stroke study conducted by the Regional Medical Program of the National Institutes of Health. Dr. B. Lewis Grossman has developed a technique for diagnosing subclavian artery occlusion utilizing Doppler ultrasonography.

Dr. Wood and Dr. Stephen L. Trokel (Ophthalmology) have examined patients with occipital lobe lesions diagnosed by angiography and have noted certain previously unrecognized differences in the visual fields of patients with tumors as compared with patients having vascular occlusions. Dr. Trokel, in conjunction with Dr. Philip M. Johnson and Dr. Wood, has begun a study of unilateral exophthalmos using the uptake of Technetium^{99m} to differentiate retrobulbar tumors from non-neoplastic processes. Drs. Trokel and Michael Tenner are studying the visualization of the optic nerves.

Division of Radiotherapy

The clinical research program for the study of the effects of radiotherapy combined with hyperbaric oxygen on advanced cancer has entered its eighth year and much additional valuable experience has been obtained. Approximately 76 patients have been given 345 treatments with minimal untoward effects. Control studies in similar advanced cancer patients treated with the same time dose schedule but not under hyperbaric oxygen conditions are continuing and they serve to emphasize the augmented effects produced by high pressure oxygen. The procedure has been found to be safe with minimal side effects. This program has been under the direction of Dr. Chu Chang.

Dr. Chang with Dr. Edgar Housepian (Neurological Surgery) has reviewed all cases of cerebellar medulloblastomas treated since 1940 and they have developed an operative staging system for better evaluation of treatment and prognosis. A new megavoltage technique for the treatment of medulloblastoma developed by Dr. Chang and used since 1965

has resulted in a three-fold increase in tumor control rate. Dr. Richard Albanese, who has been working with Dr. Chang to develop an improved oxygen microelectrode, has been awarded a two-year research fellowship from the American Cancer Society to work full-time on this project. A micro-electrode recording system developed by Dr. Albanese and Dr. Chang has been accepted as one of the most sophisticated designs for the measurement of tissue oxygen tension at a recent international workshop at the University of Pennsylvania.

Nuclear Medicine

Studies of myocardial perfusion using the inert Xenon-133 were undertaken by Dr. Philip M. Johnson and Drs. Paul J. Cannon and J. I. Haft (Medicine). The experimental model was the intact dog heart, studied before and after induction of acute myocardial infarction. Dr. Johnson with Dr. S. Chao (Obstetrics & Gynecology) is investigating Indium-113m as an agent for placental blood pool scanning. With Dr. Hilal and Dr. Wood, Dr. Johnson is also continuing his studies of cerebral blood perfusion and blood flow using the Ter-Pogossian-Picker Magnacamera. The recently acquired Auto-fluoroscope is now being evaluated.

The clinical activities continue to increase, particularly the number of time-consuming organ scintillation scans. The problem of obtaining adequate numbers of technicians is encountered in this area as well.

Support from The John A. Hartford Foundation, Inc. for the development of an Isoactivity Contour Plotter continued. The prototype mode of this plotter is expected to be assembled in the next several years.

Cardiovascular Laboratory

Research has proceeded along three lines: measurements of extravascular lung water at rest, during exercise and following acute diuresis in patients with congenital and acquired heart disease; oxygen utilization in congenital cardiac disease before and after surgery; measurements of distribution of pulmonary ventilation and blood flow in heart disease.

To gain an understanding of the factors which control fluid exchange in the lungs in congenital and acquired heart disease, Drs. Samuel Shubrooks, Albert Waldon and John O. Burris (Medicine) are measuring the extravascular lung volume in patients undergoing hemodynamic measurements of the pulmonary circulation.

Drs. Welton Gersony, Carl Steeg and Henry Gelband (Pediatrics) are measuring oxygen consump-

tion during standard exercise tests in children with congenital heart disease. The work performance and oxygen consumption are being evaluated before and after corrective cardiovascular surgery to assess changes in whole body energy utilization occurring as a consequence of flow and pressure disturbances in the heart and great vessels and the effects of corrective surgery.

With Drs. Waldo, Shubrooks and Gersony, work has begun on techniques for measuring quantitative distribution of blood flow and ventilation of the lungs in congenital and acquired heart disease and in experimental hemorrhagic shock in dogs using rapid response counting and imaging by scintillation scanning.

Teaching Activities

The four training programs conducted by the Department of Radiology are now under full swing. The training program in diagnostic radiology, a four year program which includes a year of research experience in a basic science department, is now in its third year. Drs. H. Morgan, W. Casarella, W. Stiehm, R. Auerbach, B. Hollander and B. McClenan are the current trainees in this program. The radiotherapy program now in its fourth year has one trainee, Dr. C. Wilson, since Dr. John Senyszyn was forced to leave the program prematurely because of a call to military duty.

Dr. M. Radowski, Dr. H. Pritzker, and Dr. B. Gordon are enrolled in the training program for pediatric radiology supported by the Child Health Department. Dr. John Leonidas completed his three year fellowship and accepted a position as an Assistant Professor at the Mount Sinai School of Medicine. He will head the pediatric radiology department at Mount Sinai Hospital.

The neuroradiology training program, a post-graduate program designed for those who have finished a conventional diagnostic residency, is now in its ninth year. Drs. R. Brust, C. Geilfuss, P. Moriarty, L. Rothman, H. Segall, and H. Tookoian are enrolled in this program.

The Radiation Research Laboratory continues to sponsor research projects leading to the degree of Ph.D. They also give a course leading to the degree of Master of Science in Radiologic Physics. For the year of 1968 to 1969, there is an enrollment of six students. This is supported by a grant from the Division of Radiological Health of the United States Service as part of its national program for the training of radiological health specialists. Courses in the physics of diagnostic radiology, the physics of therapeutic radiology, and radioactive isotopes

were again given by Drs. Philip Johnson, Paul Goodwin and their associates.

A postgraduate course in the radiology of the gastrointestinal tract was given to over 250 applicants. The faculty included, in addition to departmental members and invited guests from other institutions in New York City, Dr. S. Welin of Malmo, Sweden. The postgraduate course in the radiology of bones and joints was again given by Dr. Meyer Alpert and attended by over 80 people.

A formal didactic course in radiotherapy was organized for the first time by Dr. Chang and consisted of 40 lectures dealing with almost every pertinent topic in radiotherapy. A postgraduate course in radiobiology was also given.

Staff Activities

Dr. David Baker was elected president of the Society of Pediatric Radiology. Drs. Hilal, Tookian and Wood received the bronze medal from the American Roentgen Ray Society for their exhibit on aqueductal displacement by tumors of the posterior cranial fossa. Dr. Wood is Chairman of the Executive Committee of the American Society of Neuroradiology.

Dr. Johnson continued to sit on the joint Radioisotope Committee and the Diagnostic Laboratories Committee, and was appointed to the Subcommittee on Human Applications of Radioactive Materials (SHARM) of the Mayor's technical advisory committee on radiation.

Dr. Seaman continues to serve as a member of the Part III Committee of the National Board of Medical Examiners and as guest examiner of the American Board of Radiology. Dr. Seaman was elected to the Executive Committee of the American Roentgen Ray Society.

Dr. Harald Rossi continues his work as Chairman of the Technical Advisory Committee on Radiation for the Mayor of the City of New York, a member of the National Council on Radiation Protection, Chairman of Committee 4, Heavy Particles. He is also a member of Committee I of the National Council on Radiation Protection on Basic Radiation Criteria, and of Committee M-3 on Standards and Measurements of Absorbed Radiation Dose. He continues to serve as a member of the Advisory Committee on Isotope Distribution of the Atomic Energy Commission.

Dr. William Gross continued his activity as a member of a task force on, "Dose as a Function of LET" or the International Commission on Radiological Units and Measurements.

Radiological Research Laboratory

Research at the Radiological Research Laboratory of the Department of Radiology is conducted in the general areas of radiological physics, biophysics, and radiobiology. The work in radiological physics involves problems of the measurement of absorbed dose and some of the physical quantities required in absorbed dose determinations. Biophysics research activities are carried out in areas where physical and biological data may be closely correlated, while the work in radiobiology deals largely with the effects of ionizing radiation on mammals, with particular emphasis on radiation effects on the fetus and the embryo. Studies of the detailed manner in which the absorbed dose is deposited in irradiation tissues are designed to establish a connection between several of these efforts.

Brookhaven Research Facility

The development of the Radiological Research Accelerator Facility (RARAF) has continued. This is a joint enterprise between scientists from the Medical Department of Brookhaven National Laboratory and members of the Radiological Research Laboratory. The Van de Graaff accelerator has been completely rebuilt and its high voltage terminal has been charged as high as five million volts. The construction of a concrete irradiation cave, including all necessary services, has been completed and radiobiology and radiological physics experiments are expected to commence shortly. Three laboratory rooms convenient to the facility are currently in use and a well equipped machine shop services the accelerator and the needs of the research staff. Plans are being made to erect an additional large concrete shielded irradiation room and supplementary laboratory space.

Radiological Physics

The investigation into the possible therapeutic use of neutrons has been considerably extended. Depth dose and skin sparing measurements have been made for (a) the spectra obtained from beryllium irradiated by ^2H ions with energies in the range of 15 to 30 MeV, (b) 14 MeV neutrons obtained from tritium irradiated by ^2H ions, and (c) the fission spectrum obtained from a water-moderated reactor.

The multiplication properties of a small spherical chamber have been further investigated.

The investigation of the event spectra of directly ionizing heavy particles (to date only alpha particles) utilizing a "wall-less" spherical proportional counter has revealed deviation from the expected distributions.

In research utilizing solid wall chambers the use of a low-energy X-ray source has been found to be essential for measurements of energy-loss distribution and single-electron spectra. The present X-ray tube has been developed so that it can be used with spherical proportional counters as small as $\frac{1}{4}$ " in diameter. This tube has been used to produce X-rays having energies as low as 0.277 keV (K-line of carbon).

Modifications have been made in the 1" counter in order to simplify its design and yet obtain stability and improved resolution.

Biophysics

In cooperative studies carried out with members of the Brookhaven Medical Department the lens of the eye has been found to be affected by neutron doses of less than 0.5 rad. The RBE of neutrons shows a corresponding increase to values exceeding 100. The implications of these findings to radiobiology and radiation protection are now being investigated.

A pilot study made in connection with an investigation into the genetic effects of monoenergetic neutrons on *Drosophila melanogaster* has been completed. Doses of 0.58 MeV neutrons ranging from about 30 to 6000 rads were given to thirteen groups of flies to determine the frequency of dominant lethals, sex linked recessive lethals, and translocations.

Two experiments are in progress. The first, which is nearly completed, is designed to test the effect of sperm storage in the female on the induction of translocations by x-rays and also to compare the frequency of translocations in flies that eclose early and flies that eclose late among the offspring of irradiated males. The second experiment is an attempt to detect translocation mosaics in the testes of *Drosophila* males following exposure to fission neutrons.

In the course of these studies, a new "mutator" strain of bacteria was isolated. Like the few other mutator strains isolated elsewhere, the new strain showed very high spontaneous mutation rates for genes controlling many different cellular properties.

Radiobiology

Investigation continues on x-ray induced cataracts in mice following embryonic or fetal exposure and there now seems to be evidence that there is a genetic pre-disposition to the development of this lens anomaly which has confused the interpretation of radiation effects.

Another study involving low dose (10 R) ex-

posure of the pre-cleavage mammalian (mouse) egg shows that at seven hours post-conception the zygote reaches its maximum level of radiosensitivity.

A follow-up study of monkeys x-irradiated in utero showed that at certain stages of prenatal development the retina shows area development that proceeds in a wave-like fashion from posterior to anterior, and that even though the retina of the resulting adult appears to be topographically normal, it does reveal functional anomalies via the electroretinogram.

Francis Delafield Hospital

Diagnostic Division

An investigation as to the frequency with which pulmonary tuberculosis occurs as an apparently opportunistic infection superimposed upon chronic neoplastic debilitating disease was undertaken by Drs. Hind S. Teixidor and Arnold L. Bachman.

Studies on the value of the "ten second nephrogram" during routine intravenous urography were made by the staff and particularly by Dr. Nathan Geffen. It was found that filming of the kidneys 10-20 seconds after rapid injection of the contrast material during routine urographic examination frequently revealed information of importance. The shape, size, contour, position and perfusibility of the kidneys could often be evaluated. This information could not be otherwise obtained during a routine urographic procedure.

Radiotherapy Division

In the past year, Dr. Guttmann has continued to investigate the results of irradiation in the treatment of inoperable carcinoma of the lung. The patient group treated with the method developed in this department has now been followed.

A new protocol has been set up with the Department of Surgery in the treatment of patients with early carcinomas of the breast. Patients who undergo a radical mastectomy now receive postoperative irradiation. This combined procedure has been used in the past in more advanced stages of the disease but represents a new approach in management of early stages of carcinoma of the breast.

The Departments of Radiotherapy and Urology continue their combined treatment program of irradiation, surgery and chemotherapy for the treatment of carcinoma of the bladder.

The Department of Radiotherapy and Medicine continue their combined program in the treatment of advanced diseases of the reticulo-endothelial system, while patients in the early stages of Hodgkins

disease and lymphosarcoma are being treated with irradiation alone.

The Departments of Radiotherapy and Surgery continue to study the effect of a combination of radiotherapy and chemotherapy in patients with various advanced lesions of the GI tract and in different primary lesions of the head and neck areas.

During the last year studies have begun to compare the diagnostic value of bone scans and skeletal films in the detection of skeletal metastases. Only a small number of patients is available as yet but these studies will be continued.

Division of Radiologic Physics

The study of methods of image reversal by Mr. R. T. Mooney, contrast enhancement and data blending of scintiphotos has been completed. A modified video camera with a phase inverter and monitor comprise a useful system for the comparison of scintiphotos obtained from both rectilinear scanners and scintillation cameras. The system is now available for routine use in the radioisotope department.

The system previously established for assaying radioisotopes supplied by radio-pharmaceutical vendors has been modified. A commercially available Dose Calibrator with a digital readout has been obtained and is now used for routine calibration of radioactive aliquots prior to administration. Periodic comparisons are made with a well-type ionization chamber.

A scintillation probe designed for the measurement of the exposure rate in the bladder and rectum of patients has been modified. The use of field-effect and bipolar transistors made battery operation feasible; thus eliminating vacuum tubes and a bulky line operated power supply.

A dual chart recorder has been added to the Pho/Gamma Scintillation Camera to permit the charting of renal function studies.

The laboratory's thermoluminescent dosimetry system has been used to determine the dose distribution in patients, in phantoms and in various biological specimens. Dosimeters in the form of micro-rods have been very useful in radiobiological research. In addition, our preliminary studies indicate the usefulness of the system for particular personnel monitoring purposes. These include the accurate determination of the exposure to the hands of individuals involved in the following procedures: (a) elution of Technetium-99m generators; (b) injection during fluoroscopic procedures; (c) handling of encapsulated sources.

However, an overall evaluation of our personnel

monitoring requirements indicates that thermoluminescent dosimeters do not constitute an acceptable replacement for the film badge for routine monitoring.

Mr. Mooney and Kun Pal Lee have extended their investigation of the effect of oblique angles of incidence on barrier transmission. The first phase of their study, involving 6 MV x-rays, has been completed. They are currently studying the effect with Cobalt 60 and intend to include a wide range of emergencies.

A number of studies at Harlem Hospital have been completed. These include an evaluation of the shielding design of the two new cobalt teletherapy installations, periodic standardization of existing orthovoltage therapy equipment and review of personnel monitoring records and procedures.

Walter Matis has completed his analysis of a panorex dental x-ray unit. Measurements in the useful beam were made with an anthracene crystall scintillation counter and with thermoluminescent dosimeters.

Acknowledgments

The Department of Radiology gratefully acknowledges research support from United States Public Health Service, United States Atomic Energy Commission, The American Cancer Society, New York Heart Association, Booth Ferris, Fannie E. Ripple, James Picker, and The John A. Hartford Foundations.

Statistics of Radiological Service—1968

The increase in volume of the diagnostic examinations over 1967 (29,222 examinations, an increase of 19%) is the second largest annual increase in our recorded statistics. In 1966, a 25% increase occurred. Most of this is due to a large volume of emergency out-patient work on evenings and weekends. The workload in Harkness Pavilion did not increase due to the opening of the Atchley Pavilion in December.

STATISTICS OF RADIOLOGICAL SERVICE—1968

DIAGNOSTIC DIVISION

	1968		1967	
	Exams	Work Units	Exams	Work Units
Presbyterian Hospital	102,065	297,213	85,127	259,543
Babies Hospital	22,394	65,665	18,971	56,447
Neurological Institute	17,569	81,845	17,616	80,182
Harkness Pavilion	38,244	124,508	39,079	125.165
Atchley Pavilion (1 mo.)	1,202	2,803		
Ophthalmology	1,163		1,372	
Squier	5,927	42,740	6,284	44,240
Total	<u>188,564</u>	<u>614,774</u>	<u>159,342</u>	<u>557,231</u>
Chest Survey	5,167		8,776	
Francis Delafield Hospital	49,749		43,267	
Harlem Hospital	101,647		91,587	

CARDIOVASCULAR DIAGNOSTIC LABORATORY

	1968	1967
Right Heart Catheterizations	343	332
Left Heart Catheterizations	163	192
Angiocardiograms	263	298
Pacemakers	8	64

DIAGNOSTIC ISOTOPE PROCEDURES

	<u>1968</u>	<u>1967</u>
<i>Scanning Procedures</i>		
Thyroid	878	987
Liver	1,010	918
Lung	656	539
Kidney	26	47
Spleen	51	37
Body	20	30
Other	62	64
Total	2,703	2,489
<i>External Counting</i>		
Renogram	44	74
Placenta	12	45
Ra1 Uptake	896	953
Other	3	6
Total	955	1,062
<i>In Vitro</i>		
Schilling Test	210	258
RBC Survival	14	23
RBC Mass	3	9
T ₃ Resin	3,719	3,024
Other	7	—
Total	3,953	3,314

ISOTOPE THERAPY

	<u>1968</u>		<u>1967</u>	
	<u>Treatments</u>	<u>Patients</u>	<u>Treatments</u>	<u>Patients</u>
Radium	44	39	45	40
¹³¹ I	45	58		
P-32	2	7		

RADIOTHERAPY

	<u>1968</u>		<u>1967</u>	
	<u>Treatments</u>	<u>Patients</u>	<u>Treatments</u>	<u>Patients</u>
	21,614	1,141	21,909	1,187

FRANCIS DELAFIELD HOSPITAL

14,389	1,019	15,362	1,081
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HARLEM HOSPITAL

596	65
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GRAND TOTAL

Patients	2,125
Treatments	36,599

Rehabilitation Medicine

ROBERT C. DARLING

Baruch Professor and Chairman of the Department • Director of Service

This year was marked by significant additions to and changes in medical staff to meet more effectively the responsibilities for teaching, patient care and research. Dr. Paul Corcoran, having just completed an Academic Career Fellowship in Physical Medicine and Rehabilitation at the University of Washington joined the department as full-time Assistant Professor and Assistant Attending. Dr. A. David Gurewitsch retired as Professor but remains active as Special Lecturer and Consultant. Dr. Luke Chu became Chief of Physical Medicine Service at New York State Rehabilitation Hospital and Associate Clinical Professor at the College of Physicians and Surgeons. Dr. Yasoma Challenor joined the Department as Instructor, working chiefly at Harlem Hospital and Blythedale Children's Hospital. Dr. Anna Maas became physician at New York State Rehabilitation Hospital and Assistant at P&S. Dr. Horace Cosla of Harlem Hospital was appointed Associate. Miss Joy Cordery was appointed Research Associate. Dr. John M. Miller III, was promoted to Assistant Professor. Dr. Herbert Thornhill of Harlem Hospital was appointed as Assistant Clinical Professor and became an Assistant Physician at Presbyterian Hospital. Dr. Michael Carpendale of New York State Rehabilitation Hospital was promoted to Attending Physician at Presbyterian Hospital. Drs. Nathan Kaplan and S. J. Yue were promoted to Associate Attending Physicians at Presbyterian Hospital.

Dr. Charles Huckaba, as Senior Research Associate in Chemical Engineering, was assigned to P&S

for collaborative activities with the Department of Rehabilitation Medicine and the Department of Surgery.

Dr. Downey continues his studies of temperature regulation in man, utilizing paraplegics as test subjects. Working with Dr. Huckaba, he is developing mathematical models to explain past findings and develop additional crucial experiments. He also is working on hormonal responses to central cooling on vascular sensitivity in Raynaud's Disease and with Dr. John Miller on the effects of CO₂ on spinal man and dogs.

Dr. Corcoran is reimplmenting his earlier interest in measuring the energy cost of modified gaits and of the use of braces. He and Dr. Hyman Dubo, Chief Resident, are studying the effect of various braces on paraplegic ambulation.

The resident training program now regularly includes rotations to Blythedale Children's Hospital and New York State Rehabilitation Hospital.

Under Dr. John Miller a special multidisciplinary clinic was set up in Vanderbilt Clinic to handle the special problems of patients with spinal cord injury.

At Harlem Hospital a preliminary grant from the Columbia-Ford Foundation Gift was utilized to initiate follow up studies. Dr. Thornhill has made a practical study of the utility of the water mattress. At New York State Rehabilitation Hospital Dr. Michael Carpendale has perfected further a special bed to meet most of the special needs of the severely handicapped.

Occupational Therapy Courses

In 1967-68, 51 students were registered in the academic phase of the curriculum (34 degree and 7 certificate); additionally, 22 were in the clinical affiliation phase. Of those in affiliation, 11 completed requirements for the B.S. degree and 9 for the Certificate; 2 withdrew.

A course of studies leading to a Master of Science degree in Occupational Therapy was fully approved and the selection of an initial class of 10 was made from 27 applicants.

The course in human anatomy was reorganized and strengthened by the assignment of additional instructional personnel, an increase of fifty per cent in time devoted to the course and improvement in laboratory facilities.

The sequence in the psychology-sociology-psychiatry has been reorganized to include a 3-point course on the psychosocial aspects of patient care for all incoming students during the Autumn term. This is followed in the Spring term with a 3-point course on psychopathology. A course entitled introduction to research was initiated this Fall and given by Dr. Downey and Miss Cordery.

For the period September, 1967 to August, 1968 a training grant was received from the Rehabilitation Service Administration of the Department of Health, Education and Welfare for recruitment and career development.

Educational improvement funds were awarded to the physical therapy and occupational therapy courses under the Allied Health Professions Training Act of 1966 for a second year for instructional

salaries and educational equipment. The United Hospital Fund awarded a grant for the support of summer experience in occupational therapy.

Physical Therapy Courses

Twenty-four students graduated, nine of whom received the Bachelor of Science Degree and fifteen were awarded a Certificate of Proficiency in Physical Therapy. Presently there are a total of fifty-two students enrolled in the curriculum (16 juniors, 15 seniors and 21 advanced standing).

The Rehabilitation Service Administration of the Department of Health, Education and Welfare has supplied traineeships for nine students. An educational improvement grant under the Allied Health Professions Training Act of 1966 has made it possible to expand the visual aids program, research teaching and laboratory equipment.

Miss Bernadette Hecox joined the faculty on July 1, 1968 as an Assistant in Physical Therapy.

A new course entitled introduction to research has been developed and is available as an elective to senior students in occupational therapy and in physical therapy.

A directory of graduates of the physical therapy curriculum has been developed by graduates with Miss Althea M. Jones serving as adviser.

In line with University policy a Student-Faculty Advisory Committee in Occupational Therapy and Physical Therapy has been initiated. Six members of the instructional faculty were selected on the basis of their areas of instruction, and six students were elected.

Surgery

GEORGE H. HUMPHREYS, II

Mott Professor and Chairman of the Department • Director of Service

To maintain a strong central theme in presenting to students the problems faced by surgeons, in guiding interns and residents in solving those problems and in learning how to care more effectively for the patients posing them, is our continuing concern. Many disruptive forces seem to be gaining in strength. Within the profession, increasing specialization, conflicts of interest between research, teaching and practice and overlapping responsibilities in different institutions result in serious strain. More serious are the rising external demands for activities peripheral or irrelevant to the central purpose of a medical school.

It takes ten or more years to make a surgeon of a medical student and even longer for him to become expert as a scientist and teacher. The strong central theme which guides him cannot waver or vacillate. Our present best teachers began their training before the present Chairman took charge of the department twenty-two years ago, and when he leaves next year he will be conscious that the students he is teaching now will take as long to reach their prime. Is it then wise, in the face of current trends, to divide responsibility and disrupt long-term planning by fragmenting control in periodic changes of command?

This department has remained remarkably cohesive in spite of the variety of interests and talents of its members. Therein lies its strength, and the quality of its performance. This has been demonstrated more clearly than ever during the past year in meeting the needs of change with foresight and

adaptability. In leaving the department he has helped create, the Chairman is confident that the next occupant of his chair will have a strong and responsive team with which to work.

Staff Changes

Changes have been few: no deaths, two resignations and two changes in appointment. On July 1, Dr. Gerard Kaiser resigned in order to accept a position at Mt. Sinai Hospital, where he will be in charge of cardiovascular research. On September 1, Dr. Raymond Amoury resigned in order to accept an appointment as Associate Professor of Pediatric Surgery at the University of Missouri and Surgeon-in-Chief of the Children's Mercy Hospital in Kansas City. These two able young full-time men leave gaps in our staff that will be hard to fill but their taking positions of greater responsibility represents fulfillment of one of our major purposes, — the training of surgeon-teachers for other institutions as well as our own.

On July 1, Dr. Robin Rankow transferred to the Department of Otolaryngology where, as an oral surgeon, he will work with Dr. Cole and Dr. Conley on the head and neck division. On the same date Dr. Kenneth Forde, Instructor in Surgery, who transferred last year from the Bellevue to the Harlem staff, where he has been in charge of the Emergency Admitting Clinic, was appointed as Assistant Attending Surgeon and Assistant Chief of Clinic at Presbyterian Hospital. It is expected that this dual appointment will facilitate emergency transfer

of patients between Presbyterian and Harlem Hospitals.

Teaching

Although our teaching curriculum is still the same there is a ferment of discussion by both students and faculty, following the recommendations for overall curriculum change issued by the ad hoc faculty committee in June. A broad realignment of teaching objectives and methods is taking place in the medical school. The teaching committee of this department is in close contact with the faculty committee, and looks forward to a wide participation by our staff in combined and coordinated courses in the first year of the new curriculum, as well as in a variety of elective courses in the eighteen month elective period. How to concentrate into the abbreviated "core program" the essentials that surgical teachers are best qualified to give students will be a difficult problem.

In resident training the principle of rotation of residents with Bassett, Delafield and Harlem Hospitals was re-evaluated by the residency committee of the Medical Board of Presbyterian Hospital during the Fall. As a result, policies have been clarified, and the value of the principle under defined guidelines has been confirmed. Henceforth graduates will receive not only a diploma from the hospital in which their senior resident year was spent, but also a certificate from the University to indicate that their program, including periods of training in more than one hospital, formed a coordinated progressive experience under the supervision of the University department.

The training program for surgical scientists financed by a grant from the National Institutes of Health continues to appear promising. The first trainee, Dr. Francis Roe, will complete his training in April and has already accepted an assistant professorship at Yale. A fifth promising candidate, Dr. Evan Wolarsky, entered the program on completing his internship in June.

Research

Cardiac and peripheral vascular. Dr. James Malm has completed his study of the evaluation of counterpulsation in the support of the failing heart and of the changes in fat metabolism during cardiac bypass. Dr. Malm in collaboration with Dr. Frederick Bowman has also completed his study on the evaluation of aortic valve homografts and heterografts. With Dr. Brian Hoffman (Pharmacology), Dr. Paul Harris and Dr. Kari Vitikainen, Dr. Malm is now studying the pathways of conduction in the normal and abnormal human heart and its modifica-

tion by corrective surgery along with the use of surface electrograms in the evaluation of myocardial fibrosis and infarction. He has established a clinical research unit associated with the open heart recovery room. Drs. Stuart F. Sullivan and Richard W. Patterson, with Dr. Malm, are studying the oxygen uptake and the oxygen cost of breathing following corrective cardiac surgery. Drs. Harris and Eduardo Parodi and Dr. Malm are doing a clinical laboratory study of the use of homografts and heterografts for mitral and tricuspid valve replacement. Dr. Malm with Drs. Kornfeld and Heller are evaluating the psychiatric and psychological response to cardiac surgery.

Dr. Harris has completed the development of a digital readout pulse generator for the measurement of cardiac pacing thresholds and has completed his research in the use of bipolar electrograms for mapping areas of myocardial ischemia; evaluation of hepacone treated silastic catheters for myocardial revascularization; and comparative studies of physical properties of aortic homografts and heterografts. He is in the process of studying the clinical and laboratory evaluation of topographical epicardiology, and methods of sterilization and preservation of heterografts and homografts for aortic valves; setting up a monitoring system for epicardiograms and cardiac output for open heart patients; following up acute dissecting aneurysm therapy with induced hypotension. Drs. Parodi, Malm and Bowman have been co-workers in this project.

Dr. Paul Gerst is developing a computerized program for following patients with implanted artificial cardiac pacemakers. This project is meant to explore one aspect of computer application in patient care and hospital record keeping. It is designed to permit the continuous and current record of the status of all patients treated at Presbyterian Hospital with implanted cardiac pacemakers, their "pace-maker histories" and to project their need for pace-maker replacement in the future. Dr. Gerst has completed his study of acid-base disorders on pulmonary mechanics.

Dr. Arthur B. Voorhees, Jr. is tabulating all cases of vascular surgery and all patients coming through the Peripheral Vascular Clinic. Followup of portacaval shunt patients and abdominal aortic aneurysms is in progress as well as tabulation of data on patients undergoing portacaval shunts (approximately 770 cases), a 25-year study for future publication. All patients with vein graft by-passes are being analyzed. A study of the effect of splenectomy on children with cirrhosis following portacaval shunt is being made.

Dr. Joseph A. Buda has completed *The Surgical*

Treatment of Renovascular Hypertension in which 56 cases were reviewed.

Dr. Ferdinand F. McAllister is continuing investigations on the clinical problems of hypertension of renovascular origin, and is doing follow-up studies on aneurysm surgery.

Dr. John E. Hutchinson III is studying a technique of ventriculo right atrial implant shunts in the treatment of hydrocephalus. Clinical study of acute and subacute suppurative disease of the lung with particular emphasis on acute lung abscesses is being performed on the Thoracic Surgical Service at Harlem Hospital Center with Dr. Johnathan Mosse as co-worker.

Hepatic and Gastrointestinal. Dr. John F. Prudden with Drs. Richard Druss, John F. O'Connor and Lenone O. Stern (Psychiatry) have completed the project on the psychologic response to colectomy. Dr. Robert B. Hiatt with Drs. Irving Goodman and Norbert I. A. Overweg are studying the hormonal regulation of intestinal motility. Posterior pituitary tissue has been further fractioned by column chromatography, and substances have been isolated which inhibit intestinal motility in the dog. They have studied the properties of purified intestinal inhibitors with respect to electrophoretic mobility, molecular weight, thin layer chromatography, and pharmacological activity.

G. I. Physiology. Dr. Harold G. Barker is studying gastric mucus physiology in the dog. Mucus samples are collected from isolated gastric antral pouches and analyzed for mucopolysaccharide content. Studies are continuing to determine the effect of topical application of carbenoxolone sodium, a steroid-like compound alleged to stimulate gastric mucus production in the human. Results to date in these experiments show an increased production of the gel fraction of the mucus and an increased concentration of hexosamine, fucose, and sialic acid in it.

Dr. Edmund N. Goodman is studying the esophagus. Using a new probe and measuring simultaneously electrical potential and ultra luminal pressures at six areas, hiatus hernia and achalasia patients were screened. Dr. Goodman has completed studies on 84 hiatus hernia patients, 27 patients with achalasia, and five patients with scleroderma.

Metabolism. The Surgical Metabolism Unit is continuing its dual objectives of clinical research and development of advanced procedures for the intensive care of critically ill and injured patients, under the direction of Dr. John M. Kinney. The overall theme of energy exchange has been divided into investigations on tissue fuel, gas exchange, bal-

ance studies of calories, water and electrolytes and studies of alteration in heat exchange. Dr. Calvin Long and Dr. James Duke have been studying the intermediary metabolism of isotopic glucose and amino acids. These workers along with Drs. Kinney and Frank Gump have completed a study on the tissue composition of weight loss in surgical patients after elective operation. An analysis of clinical water balance as a guide to patient care, and a study of the inter-relationship between changes of body sodium, potassium and water after major operations, have been published. Drs. Gump and John B. Price have completed a study of the total blood flow and oxygen consumption of the febrile surgical patient with simultaneous measurement of splanchnic blood flow and oxygen consumption. Drs. Ross Kuehner and Charles Huckaby have developed special methodology for the online computer processing of heat production and heat loss in surgical patients.

An important addition to the research program of the Surgical Metabolism Unit has been the recent development of an engineering and computer group which is under the direction of Dr. Edward Leonard working in active collaboration on the above patient studies. An IBM-1130 digital computer is being used for support of this work under the direction of John Broell.

Dr. David V. Habif has completed the studies on treatment of massive hemorrhage in the dog with fluid gelatin and effect of I.V. salt and dextrose solutions on nitrogen excretion in fasting man. Dr. Habif is studying experimentally the use of gelatin as a plasma volume expander, evaluation of high caloric solutions for parenteral feeding in the surgical patient and liver perfusions with a fluorocarbon emulsion. Drs. Frederic Herter and Harold D. Harvey have metabolic studies in progress to compare high sodium and low sodium regimens of fluid replacement in postoperative surgical patients.

Burns and Shock. Dr. Francis C. Symonds, Jr. has completed his clinical review of 125 cases of sulfamylon treated burn cases. He is studying with Drs. Crikelair, Ronald Ollstein, Frederic J. Agate, Jr. (Anatomy) and Roger Newman, the temperature of flame burns and the use of topical silver sulfadiazine in burns. Dr. Crikelair with Drs. Ollstein and Symonds, has completed a study of burn causation and the current concepts of burn injury. He is presently studying burns and flame retardant clothing with Drs. Ollstein and Agate. Drs. Bard Cosman and Crikelair are studying the local application of gentamycin to burn wounds. Dr. Bashir A. Zikria with Dr. Jose M. Ferrer has been continuing his work with smoke poisoning, analyzing different

ources of smoke for toxic gases and their effect on the respiratory tract of dogs.

Dr. Cosman with Drs. George Knaysi and Crikelair has completed a history of the "rule of nines"; a study of the treatment of hydadenitis suppurativa; and, with Dr. Kinman Gong, a method of horizontal cross-lip flap formation.

Dr. Charles L. Fox, Jr. is studying toxic factors in burned tissue. Isolation and identification of toxic factors from normal and burned skin has been continued with Dr. Bhagwan D. Garg. Dr. Fox is investigating the mode of action of radioactive silver sulfadiazine and has shown the binding of silver by DNA. Silver is also bound by microbial DNA and by constituents of the cell walls. The binding prevents multiplication of the micro-organisms. The relationship to DNA is emphasized by the finding that unlike sulfonamides in general, silver sulfadiazine is not blocked by PAB. To study silver binding by nucleic acids, silver salts of purines, pyrimidines, and certain analogs have been synthesized.

Plastic Surgery. Dr. Symonds, Jr. with Drs. Crikelair, Ollstein and Agate and Newman are studying wrist ganglions and tendon transfers for ulnar nerve palsy. Dr. Crikelair with Dr. Lattes is studying the adequacy of surgical resection of skin lesions. With Drs. Cosman and Kastein he is also studying the horizontal cross-lips flap with pedicle at commissure and pharyngeal flap for post-traumatic palatal paralysis. With Dr. J. Ronald Brown, Dr. Crikelair is studying massive gynecomastia — its results and therapy; with Drs. Striker and Cosman the surgical treatment of submucus cleft palate and, with Dr. Cosman, the columella elongation in bilateral cleft lip, and the lateral maxillary collapse in post-aveolar cleft palates and facial nerve paralysis.

Cancer. Dr. Sven J. Kister has completed his study on nuclear grade and sinus histiocytosis in cancer of the breast, in collaboration with Drs. Sommers, Haagensen, Friedell, Varma and Cooley. With Drs. Varma, Cooley and Haagensen, he completed his study on cancer in the contralateral breast. Dr. Cushman D. Haagensen and Dr. Kister have completed their research on metastasis of carcinoma of the breast to the periphery of the regional lymph node filter and its significance. Dr. Kister, in collaboration with Drs. Haagensen and Cooley, is reviewing all primary breast cancers from the Presbyterian and Delafield Hospitals and continuing as well the work in sinus histiocytosis and nuclear grade in Columbia Clinical Classification Stage B cases. He is studying cystic diseases of the breast; Paget's carcinoma of the breast; and car-

cinoma in patients under 30 years of age. Dr. David M. C. Ju has completed his study of the correlation between parotid tumors and radiation previous to their development. He is now engaged in a thorough study of melanoma and is preparing a textbook on this subject. Dr. Grant Sanger, in collaboration with Dr. Haagensen has completed a study of 1000 internal mammary biopsies. Dr. Kenneth A. Forde with Drs. Harold Freeman, S. Shafi Ahmad, Bezar and Kuo-Chin Liu is participating in a clinical cooperation study of adjuvant chemotherapy to surgery for colorectal carcinoma. Dr. Alfred Markowitz is studying cancer of the breast, the natural history of the disease in patients who have had metastasis for ten or more years after therapy as well as the development of a new operation for cancer of the rectum. Dr. Frederic Herter is studying radioisotopic tumor growths, the mechanisms of carcinogenesis in carcinogen induced colonic neoplasms in rats, and the mechanism of action of 5-Fluorouracil, using labelled (H^3) 5 FU with Dr. Paul LoGerfo. He is studying as well the regional chemotherapy-perfusion and intra-arterial infusion and the critical clinical review of colorectal cancer in the Medical Center.

Transplantation. Drs. Buda and Frederic P. Herter established a hemodialysis unit at Francis Delafield Hospital as the first phase in the development of a renal hemodialysis and transplantation unit. Dr. John B. Price, Jr. with co-workers, Drs. Sawada and Voorhees, has continued research in heterotopic allogeneic transplantation of lobes of the canine liver to determine the feasibility of partial liver transplantation, the determinants of hepatic regeneration to immunosuppression and rejection mechanisms. Further, Drs. Price, Sawada and Voorhees have studied the modifications of the splanchnic circulation designed to investigate mechanisms of ascites relief and to decrease the severity of portal-systemic encephalopathy in dogs with and without chronic ascites produced by ligation of all hepatic veins.

Cell Physiology and Bacteriology. Dr. Katherine Sprunt with Dr. Thomas V. Santulli are working on a project to determine the role of normal flora in defense against infection. Dr. Margaret R. Murray with co-workers, Drs. Masurovsky, Benitez, Brosnan, Allerand, Kim and Veneroni, is continuing the neurological research project of the Laboratory for Cell Physiology. Permanent staff members, trainees and colleagues have been occupied with some interrelated problems at the cellular level which involve normal development and function of the nervous tissues and their counterparts in disease.

Dr. John Scudder is studying osmotic fragility as determined by a continuous recording Danon fragilometer on bloods for transfusions prepared under varying conditions of ambient air, etc. Dr. Scudder has completed osmotic fragility curves on bloods for transfusion purposes stored with different anti-coagulants.

In the experimental operating room, 686 operations were done on animals; 95 of these were performed as a part of student and resident teaching exercises, and 591 in the course of investigation programs in the department and as a service to 11 other departments in the school.

Hospitals

Presbyterian. -Maintenance of balance, both within the department, and in relation to total hospital activity has been a major concern. Teaching and training requires balance between teaching and private services, and also between the many types of surgical activity which compete with each other for our limited facilities. Because of these, which continue to be largely personnel limitations, it has been found necessary increasingly to regulate private admission procedures. In the fact of constantly greater demand than we can accommodate, a generally acceptable plan has proved difficult to establish. Nevertheless, the total number of private procedures remained essentially unchanged, while the ward operations increased slightly, resulting in an increase from 35% to 38% in ward procedures. This, with the continued effective use of semi-private teaching

beds resulted in better than 40% of all operations being performed by residents.

In the clinics there has been a slight increase, from 4,781 to 4,866 patient visits in the follow-up clinic, and from 1,892 to 2,246 in the after-care clinic. Planned improvements in the emergency area are actively progressing, so we may look forward to real improvement in this out-dated area in the not too distant future. Major planning is also active in the hospital as a whole following the move of our private offices from the Hospital to the Atchley Building which opened in November.

The establishment in September of a practice group within the department in relation to the semi-private teaching service is, we believe, a long step in reorganization in response to current trends in third party payments for medical care. It has formed a convenient mechanism for dealing with professional fees payable for services to ward and clinic patients, and, through the generosity of the staff, for applying this support to benefit the department and the school.

Bassett

Dr. Thomas P. Ashford was appointed Assistant Clinical Professor of Surgery. Dr. Ashford will spend 50% of his time in research studies of platelet function in vascular thrombosis. His remaining time will be spent treating patients with general surgical and peripheral vascular diseases. Dr. Ashford brings to the institution increased expertise in electron microscopy.

PRESBYTERIAN HOSPITAL

OPERATIONS	1966		1967		1968	
	Priv.	Ward	Priv.	Ward	Priv.	Ward
Gastrointestinal	429	238	460	238	429	258
Gallbladder	297	346	315	160	284	185
Appendix	51	94	51	78	53	95
Other abdominal	158	137	139	80	180	130
Rectal	273	55	213	49	201	55
Hernia	452	193	416	140	369	185
Breast	527	218	462	182	411	181
Thyroid	180	82	162	46	157	59
Head and Neck	276	46	235	32	197	20
Misc. Superficial	421	225	442	164	397	205
TOTAL GENERAL	3,064	1,660	2,895	1,169	2,678	1,373
THORACIC	330	200	341	226	409	241
PLASTIC	599	430	512	411	566	381
PEDIATRIC	344	482	348	409	290	416
Subtotal	4,337	2,772	4,096	2,215	3,943	2,411
GRAND TOTAL	7,109		6,311		6,354	
Per cent	61%	39%	65%	35%	62%	38%

Surgical admissions increased approximately 10% over the preceding year. There were 1262 surgical admissions and 2485 major and minor surgical procedures. Out-patient visits increased from 11,549 to 12,796. In addition, there were 9,142 visits to the Emergency General Service Clinic. Approximately one-half of these were for surgical problems.

During the year, 21 students served their fourth-year clerkship on the Surgical Service. Dr. David A. Blumenstock is continuing studies of transplantation immunobiology. Dr. Rodman D. Carter has been adapting computer techniques to the analysis of patients with carcinoma of the prostate. Dr. John Powers, Professor Emeritus of Surgery, has completed a book entitled, *Surgery in the Aged*, which has been published by the Saunders Co. Dr. John Olson contributed a chapter to this book, in collaboration with Dr. Francis Moore, on fluid and electrolyte balance in surgical patients.

During the year, the biannual Presbyterian Weekend was well attended by the staff of the Bassett Hospital and the Presbyterian Hospital. The scientific program was presented by the Bassett Hospital Surgical Staff.

Delafield

In July 1968, the directorship and character of the Medical Service at Delafield changed. Dr. George Curran, previously Director of the Columbia Division at Goldwater Memorial Hospital, assumed responsibility for Delafield medicine, bringing with him several staff men from Goldwater. This transfer of authority has had profound effects, some of which have been felt on the Surgical Service. Rather than continuing as a restricted cancer service, medicine is now open to patients with a variety of conditions; at the moment, roughly 70% of the medical in-patients are general in nature, the remainder being cancer cases under the immediate authority of a clinical oncology service. Medical residents in training at Presbyterian are now being rotated at Delafield, thus effecting not only a substantial improvement in patient care, but a closer liaison with the parent Medical Service at Presbyterian.

Delafield has consequently been altered from a pure cancer hospital to a limited general hospital with emphasis on cancer. This change has of course reflected itself on the Surgical Service. Although the prime interest of surgery and the surgical specialties remains directed towards cancer, increasing support of a general nature has been required to accommodate the Medical Service. It is unlikely that the basic cancer orientation will disappear. The

Institute of Cancer Research will be dependent on a strong clinical cancer program at Delafield for its continued support.

Because of the many transitions alluded to above, the Hospital suffered a sharp drop in census during the spring and summer months. Statistics of activities on the surgical service reflect this. In 1968 there were 5455 surgical out-patient visits, 766 admissions, 489 operations and 94 endoscopies, roughly a 15% drop from the previous year. There were 166 deaths on the surgical service with 72 autopsies (43%).

Looking forward to the establishment of a Dialysis-Transplantation Center at Delafield, a single hemodialysis unit was made operational on the Surgical Service during the Fall, the first such unit in the Medical Center. This has been functioning successfully under the aegis of Dr. Buda. The City has indicated its willingness to make renovations necessary to permit a large dialysis-transplantation area on the Surgical Service; it is hoped that this will be completed by the end of the year. In addition, plans are being drawn up for a modern and sizeable intensive care unit for the Surgical Service.

Dr. Paul Logerfo has been working in Dr. Herter's laboratory on a variety of different problems related to cancer, including a continuation of the project initiated by Dr. Richard L. White and sustained by Dr. Herter on the radioisotopic measurement of tumor growth. Drs. Duncan McCollester and Arthur Davidson have continued their studies of cell membrane isolation and the determination of the immunogenetic properties of membrane.

Throughout the year, fourth year medical students have served regularly as sub-interns on the surgical service. The third year course in cancer, sponsored by the American Cancer Society and conducted by the Surgical Service at Delafield, has continued with the same basic format. The teaching faculty for this course has included Drs. Herter, Alfred Jaretzki III, David V. Habif, David M. C. Ju, and several members of other departments.

Harlem

The inpatient staff of the Surgical Service at Harlem, augmented by consolidation with many members of the former Columbia (First Division) surgical staff at Bellevue Hospital, now consists entirely of men who are Board certified, or, in the case of a few specialty services, Board eligible. All also have faculty appointments at the College of Physicians and Surgeons. A workable, but still not completely adequate number of junior house staff, is present. In addition, an average of two fourth year

students from Columbia each month have elected an externship at Harlem, effectively supplementing the interns.

The quality of patient care in the out-patient surgical clinics is being improved by better house staff coverage. It is hoped, in thus providing earlier diagnosis and treatment, that more patients may be attracted at a stage of illness that may be treated electively, diminishing the amount of chronic or incurable problems. Trauma and emergency problems continue to constitute a large proportion of the inpatient service. Nursing and other paramedical personnel shortages continue to be a major deficiency.

In the Spring of 1969 the new Harlem Hospital building is scheduled to open. It is essential that the resulting expanded personnel and equipment needs of this building be met if the improved care which the community expects it to represent, and to which all of the staff are committed, is to be provided. Recent threats of budgetary limits on personnel and equipment have followed mandated wage increases. If these increases are not provided without restricting personnel and equipment budgets, services to patients will have to be seriously curtailed.

Dr. Aaron Prigot died in July, 1968. Drs. Nubar Astarjian and Robert Carroll resigned from the Shock Unit and Hand Surgery respectively.

The following research projects are being carried out in the Surgical Research Laboratory: enzyme studies in malignant tissues by Drs. Adrian Lambert and Y. Mashima; adjuvant chemotherapy 5-FU (intraluminal and intravenous) in surgery for colorectal carcinoma by Drs. Kenneth Forde and Harold Freeman; respiratory burns and smoke poisoning in New York metropolitan area and among firemen by Drs. Bashir Zikria and Jose M. Ferrer; and smoke poisoning, carbon monoxide poisoning and studies of inhalation injuries in respiratory burns and their treatment by Drs. Ferrer and Zikria.

Research in burns of the respiratory tract has been moved to laboratories at Harlem Hospital under the direction of Drs. Ferrer and Zikria. Dr. Ollstein's study of sulfamylon ointment in the treatment of burns has been completed.

STATISTICS

Total Out-Patient Visits.....	39,579
Total Surgical Admissions.....	4,800
Total Operations:	
General Surgery — A Service.....	426
General Surgery — B Service.....	464
Orthopedics	586
Vascular Surgery	168
Urology	248

Pediatric Surgery	386
Neurosurgery	154
Otolaryngology	358
Thoracic Surgery.....	90
Oral Surgery	22
TOTAL	3,056

Roosevelt

Roosevelt Hospital reports its ninety-seventh year as a functioning surgical department, the hospital having been founded in the year 1871. Last year Dr. Howard A. Patterson retired as Chief of Service, and similarly the end of 1968 saw the retirement of Dr. Frederick H. Amendola and Dr. James E. Thompson as Chiefs of Surgery and active members of the attending surgical staff.

The year 1968 represents the end of an epoch, during which the services of its attending staff have been voluntarily donated to the care of its large indigent population. Progress has dictated that the future functions of the staff must change and take on a new complexion, with the addition of full time salaried surgeons and the incorporation of the whole membership into a group form of practice. This has been initiated by the appointment of Dr. Walter A. Wichern, Jr. as full time Director of the Department of Surgery.

A total of fifty senior medical students from P&S served their surgical clinical clerkship here, their duties being almost identical with the hospital interns. They proved stimulating to the staff, and in turn their experience was equally beneficial to them.

Two special services were made available to the department for the first time during 1968, and have proved most valuable in their separate ways. A respiratory care unit has now functioned for a full year; and in most instances has made the difference between life and death in the 164 patients they treated. A short stay unit was opened in September and by the end of the year 231 patients had taken advantage of this service to undergo minor surgical procedures under either local or general anesthesia. This allowed the patient to avoid an overnight stay in the hospital.

Under the guidance of Dr. Chin Bor Yeoh, the cardiac surgery program was re-instituted, and during the last five weeks of the year eight cardiovascular operations, both adult and pediatric, were performed. Three of these were of the open heart variety. This program will expand in 1969 to include myocardial revascularization operations.

In 1968 there were 6,949 operations performed in the operating room, an increase of 369 cases over the previous year.

The Surgical Research Laboratory continued to function on a modest basis with studies on internal mammary artery implantation, and preliminary work on heart and lung transplantation. Cryosurgical techniques in hepatic surgery, and the effect of reversed intestinal segments on growth following massive small bowel resection were other investigative projects.

St. Luke's

The major emphasis of the Surgical Service at St. Luke's, other than patient care, has been directed toward surgical education. This program has included bedside teaching, seminars and conferences for 26 students assigned for a two-month rotation from College of P&S. There were 2,009 operations performed by 24 interns and residents on 1,492 patients admitted to the surgical teaching wards. Every effort has been made to incorporate the private patients, of whom 1,958 were admitted during the past 12 months, into the teaching program. Members of the surgical house staff were assistants at 2,491 operations performed on private patients during 1968.

The second annual postgraduate course in pre- and postoperative care sponsored by Columbia University and held at St. Luke's Hospital Center in October was attended by 103 doctors from 18 different states of the United States. These same lectures and seminars are repeated throughout the year for the benefit of the surgical house staff and medical students from College of P&S.

In the field of research and investigative surgery, Dr. Colin McCord, in association with Mr. Leonard Friedman and Professor Edward Leonard of the Department of Chemical Engineering of Columbia University, are continuing their work in the clotting properties of prosthetic materials. Drs. Merritt Hait and Richard Stark have undertaken extensive studies in the antigenic properties and possible clinical uses of Avitene, a collagen product which might prove useful in the preparation of prosthetic devices. Drs. W. Graham Knox and John P. West have undertaken an extensive review of our experiences in peripheral vascular surgery. Drs. Harold A. Zintel and Robert Edmunds remain active in the clinical drug evaluation program. Additionally, Drs. Zintel and Lawrence Simon have acquired the necessary equipment and clinical acumen for hyperalimentation intravenously in selected malnourished patients. And finally, plans have been formulated to initiate a hemodialysis and kidney transplantation program in conjunction with members of the medical service.

Evangelismos

The Columbia Cancer Clinic has continued to function under some difficulties due to political uncertainties. A total of 392 patients were admitted and 344 major cancer operations performed with 40 deaths. In the surgical pathology unit 528 tissue and 227 cytology examinations were done. Construction of the new building has been delayed by the political situation.

Other Activities

In contrast to last year when many societies met here in recognition of the bicentennial of the Medical School, this year a larger number of the staff than ever, —233 members, — attended 99 meetings in other states. Forty-four papers were read. The department continued to have many visitors from this country and abroad, notably Sir David Cuthbertson from Scotland, Dr. Barry Stoner from London, Professor Woldeyes from Haile Selassie University in Addis Abbaba, Professor Badoe, Eisenhower fellow from Ghana, Professor Milton from the University of Sydney, Australia. On March 4, Professor P. Lundsgaard-Hausen of Bern, Switzerland, spoke on gelatin as a plasma expander. On April 18, 1968 Dr. Arthur E. Mourant, Director Serological Population Genetics Laboratory, St. Bartholomew Hospital, London, gave the Twentieth John G. Gibson Lecture on population genetics of blood factors. The Twenty-first Gibson Lecture was given on November 21, by Dr. Winifred Watkins of the Lister Institute, London. She spoke on biochemical and genetic aspects of blood groups.

On May 23rd, the annual meeting of the Alumni of the Surgical Service took place. An operative clinic and a series of talks on contemporary service interests by members of the staff was followed by the annual Thomas W. Stevenson Memorial Lecture given by Professor Emeritus Jerome P. Webster on "Joseph Constantine Carpue — 1764-1846."

In the summer Dr. Malm took part in the meeting of the European Society for Cardiovascular Surgery in London; Dr. Santulli moderated a session of the British Association of Pediatric Surgery in Liverpool, and went on to give a paper at the University of Glasgow. Dr. Charles Findlay attended a dialysis and transplantation conference in Dublin, and Dr. Fox presented his work on topic silver-sulfadiazine at a symposium on the Pharmacology of Burns, in Milan. Dr. Robert B. Hiatt on July 1, left for a year's sabbatical leave, accepting an invitation to serve as Visiting Professor at the University of Sydney, Australia. In November, Dr. George H. Humphreys took part in a teaching mission in Pedi-

iatrics, led by Dr. Edward C. Curnen (Pediatrics) and sponsored by the Unitarian Universalist Service Committee in Lima and other cities in Peru.

Elections and Honors

Through the generosity of friends of the late Hugh Auchincloss an endowed professorship was established: Dr. Frederic Herter was named Hugh Auchincloss Professor. Dr. Habif was elected President and Dr. Harold Barker, Recorder of the Allen O. Whipple Society. Dr. Thomas Santulli was elected President of the New York Society for Pediatric Surgery, and Dr. McAllister, President of the New York Society for Cardiovascular Surgery. Dr. Ju was elected President of the American Chinese Medical Society, and Chairman of the New York Regional Society of the American Society of Plastic and Reconstructive Surgeons. Drs. Hoehn and Cosman were elected to this Society and Dr. Cosman was appointed Chairman of the Program Committee of its New York Regional Society.

Dr. Grant Sanger was named Chairman of the Board of the Margaret Sanger Research Bureau, which has become a unit in the International Institute of Human Reproduction. Dr. Crikelair is Chairman and Founder member of the Information Council on Fabric Flammability and a member of the National Fire Protection Association. He was also appointed Consultant in Plastic Surgery at the United States Naval Hospital, St. Albans. Dr. John Prudden is a Consultant to the Division on Physician Manpower of the National Institutes of Health.

Dr. Habif was made a member of the Graduate Education Committee of the American College of Surgeons, and Drs. Forde, Kister and Harris were made Fellows of the College. Dr. Paul Harris was awarded an established investigatorship by the American Heart Association. Dr. Malm was elected to the American Surgical Society and to the Society of Thoracic Surgeons. Dr. Price was elected to the Society of University Surgeons and Dr. Symonds to the American Association for the Surgery of Trauma.

Dr. Alfred Markowitz was elected a Delegate of the Surgical Section of the New York State Medical Society. Dr. Voorhees was elected Treasurer of the International Cardiovascular Society and to the New York Academy of Medicine, where Dr. Milton Porter is Chairman of the Program Committee of the Section on Surgery, and Dr. Bard Cosman a member of the Committee on Education. Dr. Herter is Chairman of the Program Committee of the New York Cancer Society, and Dr. Charles Findlay was elected to membership. Dr. Norbert

Overweg was elected to the New York Academy of Sciences and made a collaborator at Brookhaven. Dr. Paul Harris was elected to the New York Society for Thoracic Surgery.

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Urology

JOHN K. LATTIMER

Professor and Chairman of the Department • Director of Service

During 1968 the Department of Urology finished calibrating its third electron microscope, (capable of magnifying one million times,) had staff members elected presidents of the Society of University Urologists, (Dr. John K. Lattimer) and the American Geriatric Society (Dr. Hans H. Zinsser), supplied officers and committee members for the International Society of Urology, The World Health Organization, the National Research Council, the National Academy of Sciences, the National Institutes of Health, the American Urological Association, the American College of Surgeons, the New York Section of the American Urological Association and the New York Academy of Medicine and admitted its 69,634th patient. Dr. Fish continues as the Veterans Administration Central Office Consultant.

During the year 1968 Drs. Charles T. Hazzard and Archie L. Dean retired from practice at the Medical Center, while Dr. Peter N. DeSanctis joined the staff as Associate in Urology, after completing his residency.

The department was saddened by the death of Meredith Campbell and by both children of Dr. J. Bentley Squier, founder of the Squier Urological Clinic, namely Mrs. Ursula Squier Reimer and J. Bentley Squier, Jr.

The work of the department in the cancer research field was repeatedly shown on nationwide N.B.C. television programs, as well as those in Europe, as part of the cancer education effort.

The staff of the department again won most of the awards at the Resident's Prize Essay Contest (at

the New York Academy of Medicine, sponsored by the New York Section of the American Urological Association.

The pediatric urological activities have been strengthened by the addition of Dr. Gil Simon from the Department of Pediatrics and Dr. Warren W. Garitano from the Department of Psychiatry, both assigned to the Pediatric Urology Unit.

Major Changes in Curriculum

As part of our program to improve methods of education in urology, sponsored by the Commonwealth Fund, the department has developed a technique for televising students during simulated patient visits, wherein various diseases are discussed with the patient. With immediate playback, the mistakes and their corrections which might make the interview more effective can be viewed by the student and by the remainder of the class, who then discuss ways to improve these approaches, as well as the technical material. This has been of great help to the faculty and students alike.

Dr. Stanford Pulrang has continued as the director of the educational project of the Department of Urology. Dr. Pulrang has been of service to the new curriculum committee, surveying all available educational hardware at various meetings of the American Management Association, and interviewing the manufacturers.

The Irene Heinz Given and John LaPorte Given Fellowships in Pediatric Urology have brought to our service outstanding residents from the training

programs at Iowa State University, the University of California at San Francisco and from Jefferson Medical College, as well as Canada and South Africa.

The department's training grant from the National Institutes of Health provides basic science training or a year, interspersed among the years of regular clinical residency, for each of the house officers.

Advances in Patient Care

The study of most biopsies by tissue culture techniques which estimate the growth potential of each tumor, has been the most interesting new development in patient-care in the Department of Urology. Short-term cultures are studied by radioautography to determine the rate of DNA synthesis in any given time, whereas long-term tissue culture can be used to study the characteristics of the tumor, for precise identification and for the selection of the best form of treatment. Several new drugs, including Hiprex, Cephaloridine and Cephalexin have been studied on the Service.

Research

Dr. Meyer M. Melicow is completing a definitive, comprehensive textbook entitled, *Neoplasms of the Genitourinary Tract*.

In January, Dr. Melicow conducted his annual course in post-graduate uropathology for residents in urology and pathology and for urologists in practice, who are preparing for the American Board of Urology examinations.

Dr. Melicow also lectured on urological pathology at the University of Vermont Medical School, received First Prize at the American Urological Association Annual meeting for his exhibit on the evolution of urology.

During the year Dr. Melicow published on concomitant, unrelated neoplasms of the kidney pelvis, overlapping patterns of renal neoplasia, the prostatic nodule: a challenge and a problem, and on the evolution of urology.

Stone Research

Under Dr. Hans H. Zinsser work has continued on the incidence of various types of stones, and the impact of various therapeutic regimens in controlling recurrences of these stones. Dr. Zinsser has also been instrumental in setting up liaison between engineering and medical groups in both the University and the Academy of Medicine.

Cancer Research

Dr. Ralph J. Veenema is the President of the Medical Board of the Delafield Hospital and is Sec-

retary of the New York Section of the American Urological Association, as well as on the Research Committee of the American Urological Association and its Membership Committee. He has also been Chairman of the Visual Education Committee of the American Urological Association. During the year Dr. Veenema published on THIO-tepa bladder instillations as the treatment for superficial tumors and on testicular biopsy artifacts, RNA synthesis in prostate and bladder neoplasms, cryproterone acetate as a treatment for patients with cancer of the prostate and the reliability of exfoliative cytology of the urine in the presence of urinary tract malignancies. Dr. Veenema also acted as the liaison officer between the Columbia Urology Service and the Harlem Hospital Service under Dr. Harold Garnes. A combined Harlem-Delafield residency program in Urology has been approved and is functioning well.

Dr. Myron Tannenbaum and his associates, Mrs. Jean Todd, Dr. Martin Weiss, Jose Ortiz and Philip Tomashevsky, as well as Miss Virginia Lerch, have continued to develop techniques for growing many of the urological tissues such as cancer of the prostate and cancers of the kidney and bladder, on tissue culture media. Surveys of the bacteriological content of these cancerous prostates have also been made. Mr. Ortiz has been perfecting histochemical and special tissue processing techniques to plot the topographical localization of enzymes in organic components in tissue sections with further visualization of reaction products at a light or electron microscopic level. Mr. Tomashevsky has been studying the factors present during compensatory hypertrophy of the kidney and has some interesting biochemical findings which will be published in his doctoral thesis. Dr. Martin Weiss has been looking for virus particles in cancers of the breast which might possibly resemble those already found in our cancers of the prostate. This work is being done under the aegis of a grant from The John A. Hartford Foundation.

At the Harlem Hospital under Dr. Harold Garnes studies are also underway concerning penetrating wounds of the kidney and urethral strictures. A scientific exhibit on the repair of infected strictures was presented at the national meeting of the American Urological Association and at the National Medical Association in Houston, Texas.

Dr. Myron Roberts, has published an article on experimental cryosurgery of ureteral orifices and on the place of cryoprostatectomy. He has also shown a scientific exhibit on cryoprostatectomy, its advantages and disadvantages.

Renal Physiology

Dr. Richard C. Mason, George F. Cahill Fellow in Physiology, has continued with his studies of the mechanism of compensatory kidney hypertrophy and has also continued the work on the length-tension relationship of the canine bladder smooth muscle. Dr. Mason also assisted Dr. David T. Schwartz with his studies of the hypotensive effect of porto-caval transposition on experimental renal hypertension.

Dr. Bruno Fingerhut has continued to work on experimental studies of induced prostatic obstruction in mice (and its chemotherapy), and presented an exhibit on the RNA synthesis rates in prostate and bladder cancers. Dr. Fingerhut published his observations on RNA synthesis in prostate and bladder cancers, the effect of cyproterone acetate on cancers of the prostate and on a possible defect in RNA metabolism in leukemic cells.

Microbiology

Dr. Harry Seneca has continued his studies on the pyelonephropathy caused by lipopolysaccharides from Gram negative bacilli and also the effect of complement and non-androgenic steroids on urinary tract infections. He has also continued studies on the effect of sperm hormone on male and female mice. Dr. Seneca has continued studies of the chemotherapy of Cephaloglycin, Hiprex and Cephalexin. He is also continuing studies on the chemical, pharmacological and microbiological behavior of methenamine mandelate and methenamine hippurate as well as methenamine sulfosalicylate.

Dr. Frank Longo has continued his studies on the determination of intermediary metabolites on tryptophan in bladder tumor homogenates.

Dr. Aurelio C. Uson published on hydronephrosis in infants and children, on Wilm's tumor and on concomitant unrelated neoplasms of the kidney pelvis as well as giant hydronephrosis in children.

Dr. David T. Schwartz presented a rapid simple chemical method for the measurement of plasma angiotensin and a paper on the effect of porto-caval transposition on renal allograft rejection in the dog on the effect of porto-caval transposition on radiation nephritis induced hypertension in the dog, and on cirrhosis of the liver and renal hypertension. He also published on the incidence of arterial hypertension among 540 cases of kidney tuberculosis, and on the protection from hypertension due to renal allograft rejection by porto-caval transposition, and on renal artery stenosis in the dog. He also published on unilateral upper urinary tract obstruc-

tion and arterial hypertension, and on vicarious excretion of urographic contrast media.

Dr. Peter Puchner conducted extensive studies of the localization of thio-TEPA within the bladder wall, when used for treatment of bladder cancer, using radioactive isotopes. Dr. Dennis P. Howie is currently developing a technique for the induction of prostatitis in rats and on the measurement of tritium labeled tetracycline in both the normal and infected rat prostate glands. He also is undertaking a study of the efficacy of Y-V plasties on the bladder outlet in children with obstruction.

Dr. Arthur M. Smith is undertaking a collaborative study in the Surgical Metabolism Unit with Dr. John M. Kinney, of the impact of various drastic urological procedures on the body's electrolyte reserve.

In the annual contest for urological residents in the New York area, our residents won first prize in the clinical research category, first and second prize in the laboratory research category, and first, second and third prizes in the clinical investigation category.

Dr. Lattimer was elected president of the Society of University Urologists, was elected governor of the American College of Surgeons, vice-president of the International Society of Urology, was appointed by presidential order as a consultant to the World Health Organization in the Reproductive Field, was appointed a member of the Training Grants Committee for Urology and Renal Diseases of the National Institute of Arthritis and Metabolic Diseases of the National Institutes of Health, and was appointed a member of the Committee on the Genitourinary System of the National Research Council and the National Academy of Sciences, as well as to other committees of the National Research Council. He was presented with a large silver platter and pitcher, suitably engraved, in honor of his nine years of service as Chairman of the Committee on Pediatric Urology of the American Academy of Pediatrics. He was appointed to the Executive Committee of the American Urological Association and was placed in charge of a committee to gather information about urology as a specialty. He was awarded a certificate in honor of his delivering the Sommer Memorial Lecture series at the University of Oregon Medical School, was a guest lecturer of the Western Section of the American Urological Association, of the Kansas City Urological Association of the St. Louis Urological Association, represented the surgical specialties in a symposium or Undergraduate Surgical Education at the American College of Surgeons meeting as well as serving or

nels on nephrectomy, represented the urologists at a symposium of the Association of American Medical Colleges on Post-Graduate Education in Washington, was a member of a workshop on the "Hydrodynamics of Urinary Flow" for the National Research Council at Iowa City. He organized and conducted the meeting of the Committee for Pediatric Urology of the American Academy of Pediatrics in Chicago, and was the Davis Memorial Lecturer on Medical History at the University of Illinois, and a guest speaker at the Detroit Urological Association on Pediatric Urology. He delivered the Meredith Campbell Memorial Lecture on Pediatric Urology during the American Urological Association's meeting in Miami, as well as presenting papers on genitourinary tuberculosis there and at the meeting of the American Association of Genitourinary Surgeons.

Dr. Selwyn B. Levitt completed a study comparing the intra-abdominal pressure with the intracetal pressure, as one of the parameters for measuring bladder physiological function, specifically the detrusor pressure of each bladder. He has helped to develop the Physiological Testing Unit on the Pediatric Service, wherein every child may be offered objective tests of the function of his or her bladder, as a routine service, as well as for the purpose of developing new information in this field.

Donors

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International Institute for the Study of Human Reproduction

EDWARD C. TAYLOR, JR., M.D., *Director*

The year has been characterized by encouraging progress toward the solution of problems with respect to acquisition of a site for our proposed building, by the consummation of an important agreement of affiliation and by a modest expansion in programs already in effect.

From the time of the announcement of the Ford Foundation grant in December 1965, there have been a series of obstacles to the procurement of a suitable site for a building in the neighborhood of the Medical Center. These seem to have been overcome and a location on the block bounded by Broadway, 168th Street, Audubon Avenue and 67th Street decided upon. Negotiations are well advanced for the closure of streets and a small segment of St. Nicholas Avenue to provide for a "superblock" extending from 165th to 168th Streets between Broadway and St. Nicholas Avenue. This area will probably eventually be the site, not only of the International Institute, but of other University and perhaps Municipal educational and service facilities. The plans for the block call also for some expansion in Mitchell Park, which with the new buildings should greatly enhance the physical appearance as well as the usefulness of the area.

The original program called for an application to the National Institutes of Health for "matching funds" to double the amount available for construction. A favorable response to an application submitted in the fall of 1967 was received in April

1968. Although the approved funds were not immediately available, the assurances received were regarded as sufficient to justify proceeding with the development of detailed plans for the building as designed by the architectural firm of Roche, Dinkeloo and Associates. This work is now being actively pursued in the expectation that it may be ready to be submitted for contract bids in the late summer of 1969.

A fortunate development during the last year has been an agreement for the Margaret Sanger Research Bureau to join the Institute upon the completion of its building. The "Bureau" was founded in 1923 by Margaret Sanger in a house on West 17th Street which was formerly her home. During the 45 years of its existence the Bureau has served thousands of "patients" and has been the site of many pioneer studies by distinguished workers in medicine, physiology and social science. The inclusion of the present Bureau, under the name of the Margaret Sanger Memorial, as the clinical research division of the Institute, will bring a large patient following, as well as an illustrious name and a great tradition.

One of the special problems faced by the Institute is to develop, within the restricted temporary space available to it, an effective nucleus for the program that must be ready to unfold as soon as the projected building is ready. This is being attempted by "borrowing" space from several hos-

pitable departments of the Medical School and by renting apartments in the neighborhood for functions not requiring laboratory facilities. Portions of programs projected for the future building are now housed in space of the School of Public Health and the Departments of Obstetrics and Gynecology and of Anatomy. Administrative function, and offices for demographic and family planning research are housed in the Institute's "own" area on the top floor of the Black Research Building. A suite of five apartments in one building and a single apartment in a second building have been rented in the neighborhood.

The program for the International Institute for the Study of Human Reproduction is based on the establishment of four major divisions and the projection of two additional ones for the future. The programs in operation are the following: the biochemistry and physiology of the reproductive function; clinical investigation; biomathematics and demography; and program development and evaluation. It is planned in the future to organize divisions on the Sociology of Reproduction and on Human Genetics. Although reclassification and reassessment of subject matter may occur during the course of development of the program, the above seem to illustrate the range of interest of the Institute.

The Biochemistry and Physiology of Reproduction

The planning and development of this division is in the hands of Dr. Seymour Lieberman, (Biochemistry) and of Dr. Raymond Vande Wiele, (Obstetrics and Gynecology).

Work in Dr. Lieberman's laboratory, reported in more detail under Obstetrics and Gynecology, has been concerned with the following problems: studies on the specific uterine receptor protein for estradiol and related steroids (Dr. Paula Zimmering); the biosynthesis of cholesterol sulfate (Dr. Richard Hochberg); the testing of the viability of single cell suspensions of cow corpus luteum by incubation with various C¹⁴ labeled steroids (Dr. Harald Mickan); the nature of the hydroxylated steroids intermediate between cholesterol and pregnenolone (Dr. Kenneth Roberts); the distribution of blood-borne cholesterol sulfate between erythrocytes and plasma (Mrs. Violet Lippman); the dynamics of the uptake of estrogens and androgens by such target tissues of human endometrium and prostate (Dr. Erlio Gurgide); the theoretical analysis of curves of disappearance from the blood of intravenously injected tracers (Dr. Jonah Mann and Dr. Gurgide); and the rate of transfer of estrogens

across the walls of the Graafian follicles (Dr. Eleanora P. Giorgi).

The laboratory of Dr. Vande Wiele is engaged partly in basic work in physiology and partly in clinical investigation. In the former area may be noted the following: application of the principles of control theory to the menstrual cycle in relationship to measurable factors that may regulate it (with Dr. Gurgide and Mr. Robert J. Bogumil of the School of Engineering and Applied Science); application to the monkey of neuroendocrine techniques of study that have been worked out in smaller animals (Dr. Peter Carmel); the development of steroid-antibodies, produced by immunization of sheep with conjugates composed of a steroid moiety coupled to bovine-serum-albumin; the use of these antibodies as an analytic tool to measure minute amounts of estrogen in the blood (Dr. Michel Ferin); and the synthesis and transfer of hormones across the placenta in sheep (with the Departments of Anesthesiology and Obstetrics and Gynecology).

In a separate unit, Dr. John M. Bedford (Anatomy), is working on the important problem of sperm capacitation, the process by which spermatozoa in their passage through various ducts become capable of fertilizing the ovum. He has demonstrated the role of the ovarian hormones in maintaining the ability of the Fallopian tube to bring about this change and the relative roles of tube and uterus in the process. Studies with the electron microscope have been begun to determine the structural changes associated with loss of fertilizability of the ovum and those of the acrosome cap of the spermatozoon accompanying maturation.

In the affiliated laboratories of the Obstetrical and Gynecological Division of the Harlem Hospital, Dr. Muriel Feigelson is studying the regulatory factors, steroids and hypophyseal protein hormones which govern the progressive augmentation of hepatic histidase during puberty and its maintenance in the adult rat. In a similar relationship Dr. Michael Levi, Dr. Ines Mandl and their associates are studying a factor present in aqueous extracts of hops and brewer yeast which causes complete lysis and resorption of the fetus on any day through the first three weeks of gestation.

Clinical Investigation

Research involving clinical investigation ranges from studies that are little different from those categorized in the previous section to those concerned with the statistical results of purely clinical programs. The development of this division is generally the responsibility of Dr. Vande Wiele.

In Dr. Vande Wiele's own group, the following projects have been undertaken: study of the metabolism of gonadotropic hormone in normal men and women using a sensitive radio-immunoassay method (Dr. Tawfiq Rizkallah and Dr. Gurpide); an extension of these studies to the measurement of LH and FSH in samples of pulmonary, hepatic and renal blood (with Dr. Gerald Turino, Medicine); measurement of the secretion of growth hormone in patients with amenorrhea (with Dr. Tibor Engel and Dr. Andrew Frantz, Medicine); studies concerned with the induction of ovulation in amenorrheic women with human follicle stimulating hormone and chorionic gonadotrophic hormone given in sequence; similar studies in hypophysectomized patients; investigation of the hyperstimulation syndrome in patients treated with gonadotropins; and studies of sexual function and sexual identification in patients with various endocrine abnormalities (with Dr. Alexander Levay, Psychiatry).

The Institute has continued its sponsorship and partial support of the long term clinical study being conducted by Dr. Robert E. Hall on the comparative advantages and disadvantages of four contraceptive methods offered to all clinic patients delivered at the Sloane Hospital since January 1, 1966. When new patients cease to be added to the study group on December 31, 1968, the file will contain approximately 10,000 cases. These cases after two years of follow-up will provide fundamental data on the important problems involved. Dr. Hall is also continuing the follow-up of 2,500 still active cases of women fitted with the intrauterine device since April 1963.

Dr. Ralph Richart (Pathology) and Dr. Robert S. Neuwirth (Obstetrics and Gynecology), are continuing their search for a technique by which appropriate chemical substances could be applied transcervically to the Fallopian tube for the purpose of producing obstruction and infertility. Such a technique might be enormously valuable in certain countries in which the family planning program may depend heavily on some form of surgical sterilization. Dr. Reba Goodman (Pathology), with Dr. Richart and Dr. Takashi Okagaki (Pathology), are making electronmicroscopic studies of the "K" cells of the human corpus luteum and of the cyclical changes in the cells of the Fallopian tube that occur during the normal menstrual cycle.

In collaboration with the Department of Urology, studies are being made by Dr. Moshe Markowitz (Urology), on testicular function, based on a radioautographic technique, to show the incorporation of labeled precursors of DNA and RNA into repli-

cating germ cells. These techniques are being applied to the investigation of cases of oligospermia, and to cases with other causes of testicular failure.

Division of Biomathematics and Demography

The program in this division has been during the last two years under the direction of Dr. Mindel C. Sheps (Biostatistics — Public Health), and Dr. Jeanne Clare Ridley (Biostatistics — Public Health). Dr. Sheps has now submitted her resignation to be effective at the end of the calendar year of 1968, after which the programs will be under the immediate direction of Dr. Ridley. The two programs to be described are evidently of great relevance to the problems of population changes.

New York City Fertility Survey. The major objective of this research project is to obtain basic data on the reproductive behavior of women living in New York City. In addition to collecting data on the demographic, sociological, economic, and biological aspects of natality, this study would provide data for estimating the need, demand, and possible uses for such services as pre- and postnatal care, family planning, and health care of infants and children.

Considerable progress was made from October 1967 to June 30, 1968 in planning this project. The major focus of the work undertaken was on the development of a questionnaire appropriate to the low income groups in the city. A field pre-test was carried out in February with 25 women. A major revision of the questionnaire was undertaken and completed by June. Unfortunately because of the resignation of an assistant in this project, Miss Claudine Papo, to return to France, work has been temporarily discontinued until restaffing can be accomplished.

Computer Simulation Study of Human Fertility. The second major project is the study of quantitative effects on natality of the various demographic and biological factors, the evaluation of the sensitivity of different natality indices, and investigation of sampling problems.

REPSIM-A, a computer simulation model, uses Monte Carlo methods to generate the reproductive history of a birth cohort of women. Data derived from REPSIM-A were analysed during the year. Two papers resulting from these analyses have been accepted by journals for publication in 1969.

During this year, considerable progress was also made in the development of a new and more flexible computer simulation model, REPSIM-B. This model is an extension of the earlier model, REPSIM-A. It

is expected that the technical details for this program will be completed by early 1969. During the year 1966-1967 this program was funded by the Institute, but beginning on July 1, 1968 it received a special three-year grant from the Ford Foundation.

This division has been active in other areas, including the development of quantitative approaches to natality under a grant from the National Institutes of Health, the preparation of a monograph on stochastic family building models, and in the translation of a number of papers from the French on family building models.

Both Drs. Sheps and Ridley serve as editorial consultants to a number of scientific journals and as members of important committees concerned with population dynamics and statistics. Dr. Ridley is Chairman of the Subcommittee on Fertility Statistics of the Population Association of America.

Division of Program Development and Evaluation

This division has expanded rapidly under the skillful direction of Dr. Samuel Wishik (Public Health). Its activities have required the leasing of some 4,500 square feet of office space, an area not far short of what will be required for its program when the building is completed.

Dr. Wishik's past experience with family planning programs in Pakistan and in other developing countries abroad has given him a view of the many types of organization under which family planning is being presented in different areas of the world. The principle objective of his division is to develop techniques for the evaluation of the effectiveness of various special program models in terms of certain early indicators of change in reproductive patterns of the people. To accomplish this he is developing a central unit at the Institute, but with selected peripheral field stations in areas of the world where typical family planning programs are available for evaluation. Arrangements for such study areas have been made in Haiti, Trinidad and Pakistan and a number of others are projected. Attention has also been given to work in the immediate community and an application has been submitted with others through the mediation of the Population Council to the Office of Economic Opportunity for the sup-

port of a community "Outreach" program in family planning.

Under the general heading of Program Development, Dr. Taylor with Dr. Bernard Berelson of the Population Council has published a paper offering the thesis that family planning is most acceptable and most effectively presented as part of maternity services. Estimates have been made as to what a world program for the development of adequate maternity services, as an essential step toward a solution of the world's population problem would cost. To check the validity of these theoretical cost estimates, a grant has been obtained from the Commonwealth Fund for a joint survey by the Population Council and the Institute of the maternity services of five developing countries, with the view to obtaining reliable cost estimates of the completion of facilities, staff and buildings for a systematic and complete combined maternity-family planning service.

The teaching activities of members of the Institute have not been formalized, but have been extensive. Drs. Sheps and Ridley have contributed to the teaching in population dynamics in the School of Public Health. Dr. Vande Wiele has organized a course in endocrinology for interested students. Dr. Wishik is organizing a brief but intensive course for workers, especially from abroad, in the subjects of reproductive physiology, contraceptive techniques and the organization of family planning programs. Dr. Hall, as President of the Association for the Study of Abortion, has been instrumental in the organization of an International Conference on Abortion held in Hot Springs, Virginia, in November.

The nature of the work of the International Institute has required extensive travels abroad. Dr. Lieberman spent some weeks in six countries in Europe on inspection visits to various laboratories for the Ford Foundation. Dr. Hall attended the Sixth World Congress on Fertility and Sterility at Tel Aviv. Drs. Lieberman and Vande Wiele attended the Third International Congress on Endocrinology in Mexico City. Dr. Wishik in particular has traveled extensively visiting such places as Pakistan, Thailand, Haiti, Trinidad and several countries in South America. In the summer Dr. Taylor traveled for some weeks in India as a special consultant to the World Health Organization, visiting Iran and Turkey on the way home.

Institute of Comparative Medicine

Ross M. GREY, D.V.M.

Curator of Animal Husbandry and Chairman of Institute of Comparative Medicine

In the spring of the year the department was one of 99 animal care facilities approved by the American Association for the Accreditation of Laboratory Animal Care. Only 22 medical schools were included in the above group. While the Laboratory Animal Welfare Law (P.L. 89-844) does not yet apply to animals used in research, the standards for the handling, care and treatment of the animals as set forth in the law have been followed by the department and we are inspected monthly by inspectors from the United States Department of Agriculture.

In April, the department, on the invitation of the National Academy of Science, was represented by Dr. Doris Mitchell at the International Conference for Agricultural Research Priorities for Africa. The conference was mainly concerned with animal diseases and ways and means of increasing protein production in the developing nations. While in Africa, Dr. Mitchell visited animal research stations in Ghana, the Congo, Kenya, and Ethiopia.

A grant from the Arthur B. Krim Foundation enabled the department to hold a summertime program for neighborhood children between 9 and 15 years of age. Twenty-three children under the direction of Dr. Mitchell were introduced to the varied possibilities of careers in the biomedical fields.

Since enabling laws permitting the establishment of the National 4-H program for children have been

passed for many years, the department did considerable research into the possibilities of getting the program started in Harlem and Spanish Harlem. For the past year and a half this idea has been pursued. A promise of funds to establish two pilot projects has been made by the Committee on Urban Community Affairs and details are now being worked out. Contrary to popular opinion this education program sponsored by the Extension Service of the United States Department of Agriculture, the land grant college, and the counties is not limited solely to agricultural projects. Many projects applicable to the inner cities have been worked out, and the program is already established in many of the large cities in New York State as well as the nation. The 4-H program is a very valuable means whereby inner city children can be brought into the brotherhood of nearly 3,000,000 other American boys and girls presently in 4-H which has for years motivated much of the nations youth to be happier people, live in a better home, build a better community, lead in a better nation and serve in a better world. The success of the program depends upon the communities involved as project leaders must come from the neighborhoods in which the children live. Since there are projects in history, art, community beautification, electronics, rocketry, motors, radio, foods, clothing, home improvement, dramatics, mechanics, engineering social sciences, embryology, veterinary

science, floriculture, horticulture, and many others, anyone in the community with a basic skill or knowledge of any sort can serve as a project leader and actively participate in the solving of our many problems.

The department conducts two seminars in Comparative Pathology for the Department of Pathology. In collaboration with Dr. John Budinger, pathologist for Lawrence Hospital and consulting pathologist for the Bronx Zoo, the thirty hour graduate elective seminar discusses common biological processes in human and animal pathology and presents naturally occurring animal diseases which serve

well as models for human diseases. Zoonoses are also discussed. Some examples from the collection of the New York Zoological Society are presented and a field trip is made to the zoo.

A shorter seminar in comparative pathology in the Disease Review Series (Dept. of Pathology) acquaints interested students in the field of laboratory animal medicine.

The department housed 83,503 animals of 21 various species and provided the usual animal husbandry, veterinary, diagnostic and consulting services for the investigating teams as has been provided in previous years.

Medical Library

THOMAS P. FLEMING

Professor of Library Service

The Medical Library has become more and more an essential tool in the daily work of those individuals engaged in research, education and patient care. The resources of the Library continue to grow to meet the needs of its clientele. The expanding programs at the Medical Center and the addition to the curriculum of the various schools of many paramedical and related subject areas, finds the Library collecting in engineering, management, sociology, etc. The Library's collection increased by 9,398 this year. We added 9,937 volumes, and withdrew 539 volumes. As of this date the Library's collection consists of 292,655 bound volumes. The Library receives 4,388 serials currently. Almost all the languages of the world are represented in the collection. As noted previously, the total figure does not include some 15,000 unbound volumes, the portrait collection and approximately 2,000 lantern slides on the History of Medicine.

Although each year the Library adds eight to ten thousand volumes to its collection, we must still turn to other libraries to meet some of the requests made by the clientele. This year we borrowed 626 volumes, a slight decrease from last year's figure of 823. More than half this total was borrowed from local libraries, mainly the New York Academy of Medicine, and of the remaining number of volumes, 71 percent, were borrowed from the National Library of Medicine. Our loans to other libraries increased about 15 percent over last year's figure. We supplied 2,679 volumes to 272 libraries throughout

the United States, Canada, Finland, Roumania, and Germany.

From December, 1967-November, 1968, 55,794 volumes were loaned for a two-week period and an additional 4,973 volumes were loaned for a two-hour and/or overnight loan. We estimate that 115,340 persons used the Library and that 126,122 volumes were consulted in the Library.

The reference staff of the Library, in addition to answering inquiries by phone, letter and on the spot, conducts the important function of our Bibliographic Service. This service provided over 10,000 citations to the literature to investigators in various departments based on their interest profiles. In addition to the Continuous Bibliographic Service, retrospective and comprehensive bibliographies were prepared for forty subjects. We are currently searching the literature on twenty-two subjects for sixteen subscribers in twelve departments. The Library also prepares MEDLARS searches.

The teaching function of the Library continues to expand. We are pleased that more schools and departments realize the importance of having the librarians give lectures to their students and staff on the use of the literature, and at the same time inform them of the resources and services available to them from their library.

The Medical Library again served as the laboratory for thirty-one students in the special courses in Medical and Science Librarianship which are given by the Librarian at the Medical Center, under

the auspices of the School of Library Service. Students from Israel and Nigeria were represented in the classes. Librarians from various parts of the United States as well as librarians from Japan, England, Australia, Sweden, France and Austria were visitors to the Library during the year. Problems of mutual interest and old and new procedures and techniques were discussed.

The Library's major exhibit this year was centered around Medical Center physicians who have made significant contributions in clinical research during the past forty years.

The Library became responsible for the administration of two additional libraries this year — the Harlem Hospital Center Library, staffed at the present time by a professional librarian and four supporting staff members, and the International Institute for the Study of Human Reproduction at Columbia University, Program Development and Evaluation Library, staffed by a professional librarian and a part-time supporting staff member.

The following appointments were made: Reference Section: Sheila Finnigan, Assistant Reference Librarian; Parkinson Information Center: Janet Lefkovitz, Assistant Reference Librarian; Miriam Sun, Assistant Reference Librarian; Blanca Miyamoto, Assistant Reference Librarian; Elida Stein, Assistant Reference Librarian; Dr. George Lukas, Indexer; Vera Sultan, Indexer; Harlem Hospital Center Library: Man D. Chowdhury, Librarian; International Institute for the Study of Human Reproduction at Columbia University, Program Development and Evaluation Library: Sidney A. Blumenthal, Librarian.

The following resignations were received: Reference Section: Sandra Bernstein, Assistant Reference Librarian; Parkinson Information Center: Samuel J. Waddell, Head, Information Services; Camille M. Forma, Assistant Reference Librarian; Mary Schlesinger, Assistant Reference Librarian; Elena Tanaescu, Assistant Bibliographer.

Professional staff members of the library are active in various professional organizations. Professor Thomas P. Fleming continued his membership on the Council of the Renaissance Society of America. He is also a member of the Subcommittee on Orthopedic Information of the Committee on the Skeletal System of the National Academy of Sciences — National Research Council.

Cecile E. Kramer completed her term of office with the Committee on Continuing Education, Medical Library Association. Miss Kramer taught the course in "Human Factors in Medical Library Ad-

ministration" at the pre-convention one week Continuing Education Institute for Health Sciences Librarians in Denver, Colorado, and taught the course "Biomedical Reference Tools" at the annual convention of the Medical Library Association in Denver. She also taught this course in Syracuse for members of the Upstate Regional Group, Medical Library Association. Miss Kramer is chairman of the Scholarship Committee, New York Regional Group, Medical Library Association.

Miss Ellen Schwartz, Head, Indexing and Bibliographic Section, Parkinson Information Center, is a member of the Hospitality Committee, New York Regional Group, Medical Library Association.

The Library continued to verify bibliographic citations included in all articles accepted for publication by the *Journal of Clinical Investigation*. For this service the library is supposed to receive from the *JCI* office all journals received by them on exchange.

Books, periodicals and manuscripts continue to be received by the Library via gifts from the generous members, past and present, of the Medical Center family. Space does not permit a listing of all our donors, but our sincere appreciation is extended to all of them. In many instances it is through these gifts that the Library can provide extra copies of heavily used titles. More than 42,000 items were received this year, an increase of 24 percent over last year. Dr. Jerome P. Webster continued his past generosity in support of the Jerome P. Webster Library of Plastic Surgery, which is probably the greatest library in this subject field in the world. The David Byron and Ira Olsan Gift, established in 1962, continues to provide a generous sum of money each year for the acquisition of monographs.

The services of the Medical Library Center of New York, of which Columbia is a member, continues to be of help via its daily trucking service for interlibrary loan pick-ups and deliveries, deliveries of materials which we have stored there, through acquisition of unique materials and through its Union List of Serials Section. This year a second edition of Phase I of the Union Catalog of Medical Periodicals was published. It contains a listing of medical and paramedical periodicals in existence in 1950 and new titles published since then, with holdings of eighty-three libraries in the New York Metropolitan area, as of December 31, 1967. Interlibrary loans are greatly facilitated by this tool.

In our constant effort to gain space and at the same time weed the collection of material not used enough by our clientele to warrant valuable shelf

space, we withdrew from the collection and sent to the Medical Library Center, 43 bound and 551 unbound serials representing 219 titles. An additional 8,182 bound and unbound items were sent to the Center as gift material, representing titles which we believe should be available in the area, but would not be in such heavy demand by our clientele to warrant providing shelf space for them.

The Parkinson Information Center, the first of four neurological information centers established by the National Institute of Neurological Diseases and Stroke, has completed its fifth year of operation. It has continued its international program of services and publications, collecting and disseminating information on Parkinson's Disease and other extrapyramidal disorders.

The recent promising results for the treatment of Parkinsonism with L-DOPA has led to increased demands from the scientific community for information in this field. It has also led to a proliferation of material being written on the subjects.

The current awareness publication *Parkinson Disease and Related Disorders: Citations from the Literature* is being mailed to more than 1,100 scientists and departments of neurology throughout the world. This lists citations to pertinent journal articles, books, meetings and symposia, government reports, and dissertations.

More than 30,000 citations to documents have been stored on magnetic tape at the Columbia Computer Center for use in automated retrieval. In the past year, using this data bank, the Parkinson In-

formation Center has compiled forty bibliographic searches in response to requests from scientists. More than eighteen hundred requests for copies of the searches prepared by the Center have been filled.

The Parkinson Information Center has continued its cooperative arrangement with the National Library of Medicine, to process literature for inclusion in MEDLARS and Index Medicus. Literature analysts now index fifty-four neurological journals for MEDLARS.

A new project has been initiated between the Parkinson Information Center and the SUNY Biomedical Network. Using our IBM 2740 terminal we have direct access to the IBM 360 computer in Syracuse. This, in turn, gives us access to data banks of the National Library of Medicine and the member units of the Biomedical Network.

We are always pleased and proud when the Library is acknowledged in print. This year acknowledgement was given to the Library and in particular to Dr. Vera Ortynsky, Reference Librarian, by Dr. Sidney C. Werner in his article on the thyroid in the *Annual Review of Physiology*, vol. 30, 1968.

The year closed with great promise and serious discussion concerning new quarters for the Library. The Library has the resources and staff to offer excellent medical library service to its clientele and should have the physical quarters which accompany this type of service. We hope that next year we can report some concrete progress toward the ground breaking ceremonies for the Augustus C. Long Library.

1968 Publications of Members of the Professional and Academic Staffs

Anatomy

Agate, Frederick, J., Jr.

Changes in the mammary glands of pregnant to non-pregnant parabiosed rats. *Anat. Rec.* **160**:457, 1968.

Allerand, C. D. and Murray, M. R.

Endogenous influences on myelin formation in new born mouse cerebellum in vitro. *Arch. Neurol.* **19**:292, 1968.

Regional factors influencing myelination in developing cultures of newborn mouse cerebellum. Abstract Amer. Assoc. Anatomists Meeting, New Orleans, *Anat. Rec.* **160**:306, 1968.

Applebaum, Edmund and Philippas, George

Age change in the permanent upper canine teeth. *J. of Dent. Res.* **47**:411-417, 1968.

Location of irregular secondary dentin formation. *J. of Dent. Res.* **47**:769-778, 1968.

Bedford, J. M.

Estrogen-dependance of sperm capacitation in the rabbit fallopian tube. *Anat. Rec.* **160**:312, 1968.

Effects of duct ligation on the fertilizing ability of spermatozoa from different regions of the rabbit epididymis. *J. Exp. Zool.* **166**:271-282, 1968.

Observations on the fine structure of spermatozoa of the bush baby (*Galago senegalensis*), the african green monkey (*Ceropithecus aethiops*), and man. *Am. J. Anat.* **121**:443-460, 1968.

Experimental requirement for capacitation and observations on ultrastructural changes in rabbit spermatozoa during fertilization. *J. Reprod. Fert. Suppl.* No. 2, 35-48, 1968.

The influence of the uterine environment upon rabbit spermatozoa. In: *Reproduction in the Female Mammal*, Eds. Lamming and Amoroso (Butterworth) 478-499, 1968.

Benitez, H. H.; Masurovsky, E. B. and Murray, M. R. Hypothalamus: Development in vitro. Formation of synapses and distribution of monoamines, XIIth Intl. Congress of Cell Biology, Brussels, Belgium, August, 1968. *Excerpta Medica Intl. Congr. Series*, No. 166, Abst. **46**:38, 1968.

Brosnan, C. F.; Bunge, M. B. and Murray, M. R.

The formation of acid phosphatase-positive, multi-laminated bodies in cultured neurons exposed to chlorpromazine. *J. Cell. Biol.* **39**:17, 1968.

Brandt, P. W.; Reuben, J. P. and Grundfest, H.

Correlated morphological and physiological studies of isolated single muscle fibers II. The properties of the crayfish transverse tubular system: Localization of the sites of reversible swelling. *J. Cell. Biol.* **38**:115-129, 1968.

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Sarcomere and myofilament changes accompanying local contractile activation in crayfish muscle fibers. *Fed. Proc.* **27**:375, 1968.

Bunge, M. B.; Bunge, R. P. and Peterson, E. R.

The onset of synapse-formation in spinal cord cultures as studied by electron microscopy. *Brain Research.* **6**:728-749, 1968.

Bunge, R. P.

Glial cells and the central myelination sheath. *Physiol. Rev.* **48**:197-251, 1968.

Bunge, R. P. and Bunge, M. B.

Electron microscopic observations on colchicine induced changes in neuronal cytoplasm. *Anat. Rec.* **160**:323, 1968.

Bunge, R. P. and Harter, P. H.

Cytopathic effects of visna virus in cultured mammalian nervous tissue, *J. Cell. Biol.* **39**:164, 1968.

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The precipitin band as a mechanical barrier revealed by gel diffusion studies of gonadotrophic hormones. *Proc. Soc. Exp. Biol. & Med.* **127**:1251-1254, 1968.

Cooper, George, W. and Prockop, Daewin, J.

Intracellular accumulation of procollagen and extrusion of collagen by embryonic cartilage cells. *J. Cell Biol.* **38** (3):523-537, 1968.

Cooper, George, W.; De La Haba, G. and Elting, V. Myogenesis of striated muscle in vitro: Hormone and serum requirements for the development of glycogen synthetase in myotubes. *J. Cell. Physiology.* **72**:21-28, 1968.

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- Laemle, L. K.
Visual pathways of the lemurs. *Anat. Rec.* **160**:380, 1968.
- Levi, M.; Parshley, M. S. and Mandl, I.
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Report of the Dean of the Faculty
of Dental and Oral Surgery
School of Dental and Oral Surgery
Columbia University in the City of New York

Report of the Dean of the Faculty of Dental and Oral Surgery

During the academic year 1967-68 the School met its educational objectives with a continuing high degree of success. During this year a number of significant changes occurred within the instructional and administrative pattern of the School. The Division of Oral Biology began its activities in both instruction and research, achieving a notable degree of correlation between the basic and clinical sciences. Substantial progress was made by a sub-committee on curriculum towards the development of a new program of dental instruction which will stress a multi-faceted approach. These new curriculum changes are planned to integrate with those proposed by the Faculty of Medicine. During this year Dr. Gilbert P. Smith resigned as Dean of the Faculty of Dental and Oral Surgery and assumed the position of Professor of Dentistry and Dean Emeritus. The Faculty wishes to record here its deep appreciation of the efforts of Dr. Smith during his tenure as Dean.

Dr. Melvin L. Moss assumed the position of Dean on July 1, 1968.

Ten undergraduate students were appointed as summer fellows under a program of the United States Public Health Service. They participated in research activities in the several basic science departments as well as in selected divisions of the School. Forty-six students were admitted to the first year class in September, 1968. These students were selected from a total of 461 applicants. The number of such applications continues to increase each year.

In the area of postgraduate education we are also witnessing an increase in professional demands upon us. Two hundred and twenty-six applications were received this year, contrasting with 180 such applications in the previous year. Of this number a total of 48 students were accepted for courses starting in September, 1968, as follows: orthodontics — 22; endodontics — 4; pedodontics — 5; periodontics — 11; oral surgery — 6.

Legal requirements for participation by dentists in a number of governmental dental care programs are also increasing the need for the School to offer continuation courses. Twenty-six students were enrolled in such activities in this year.

The courses for dental hygiene continue at their high level of professional activity. In program A

for students who have completed two years of study in a college of arts and science we have 10 junior and 13 senior students enrolled. In program B for students who have completed a two-year curriculum in dental hygiene at an approved college prior to their admission here, there are 8 junior and 9 senior students. Eighteen candidates for the degree of Master of Science in Dental Hygiene are also enrolled. This makes a total of 58 students.

The registration for the School of Dental and Oral Surgery in September, 1968, was as follows:

Undergraduate Program	142
First year	46
Second year	40
Third year	33
Fourth year	23
Non-credit Postgraduate Courses	11
Postgraduate Certificate Courses	95
Endodontics — First year	4
Second year	6
Oral Surgery — First year	6
Second year	4
Third year	3
Orthodontics — First year	22
Second year	23
Pedodontics — Second year (full time)	1
First year (half time)	3
Cerebral Palsy Fellows — First year	1
Second year	1
Periodontics — First year (full time)	7
Second year (full time)	5
First year (half time)	2
Second year (half time)	7
Prosthetics	0
Courses for Dental Hygienists	60
Junior year	19
Senior year	22
Master of Science	19
GRAND TOTAL	308

The following degrees and certificates were approved by the Faculty and awarded by the University:

Degrees:		
Doctor of Dental Surgery	29	
Bachelor of Science in Dental Hygiene..	18	
Master of Science in Dental Hygiene....	8	
Certificate of Proficiency:		
Oral Surgery	1	
Orthodontics	22	
Pedodontics	5	
Periodontics	5	
Prosthetics	1	
The School of Dental and Oral Surgery wishes to express its appreciation for contributions made in support of its program by many anonymous donors and the following: Dentists Supply Company of New York through Mr. Henry M. Thornton, President; Mr. and Mrs. Henry Pipp of Cleveland, Ohio; The Kleinbaum Fund; National Institute of Dental Research; United Cerebral Palsy of New York City, Inc.; United Cerebral Palsy Research and Educational Foundation; Forest Laboratories; Block Drug Company; United Medical Laboratories; Bristol-Myers Co.; United States Public Health Service; Eli Lilly & Company; Quinton Company, Division of Merck & Co.; J. F. Jelenko & Company; American Fund for Dental Education; Oral B, Division of Chemway Corporation; Rogosin Foundation; Climax Dental Supply Company; Colgate-Palmolive Company; The Italian Dental Society of New York, Inc.; and The Women's Auxiliary of the Eleventh District Dental Society.		

The School of Dental and Oral Surgery wishes to express its appreciation for contributions made in support of its program by many anonymous donors and the following: Dentists Supply Company of

Dental and Oral Surgery

MELVIN L. MOSS

Dean of the Faculty of Dental and Oral Surgery · Director of Service

New appointments to the staff of the Department of Dental and Oral Surgery were: Assistant Professor of Dentistry, Edward C. McNulty; Assistant Clinical Professors, Bertram Blum, Allan L. Firestein, Robert Himmelfarb, Herbert Ostreicher and Martin Stern; Instructors, Miss Carolyn M. James, Louis B. Jannetto, Michael Z. Marder, William Steinbel and Miss Mary J. A. Wehrle; Lecturers, Theodore Adler and Lawrence R. Gurin; Assistants in Dentistry, John E. Cinguina, John V. Donovan, John A. Flavia, James L. Mercadante, Frank W. Pandolfo, Joseph M. Ragosta and Charles S. Solomon.

The following promotions were made: Jack Budowsky to Clinical Professor; Walter G. Spengerman, Robert Umans, Robert F. Walsh and Bernard H. Wasserman to Associate Clinical Professors; Reynold J. Baumstark, Morton S. Brod, Monroe M. Gliedman, Richard Gliedman, Saul N. Greenberg, Michael Z. Marder, Stanley M. Steinerman, Bernard Telsey, Ephraim Weinstein, Stephen Wotman and Albert Zengo to Assistant Clinical Professors; Abraham Greenberg was transferred from the Department of Anatomy and was promoted to Assistant Clinical Professor of Dentistry; and James G. Coyle and Eugene P. LaSota to Instructors. The following changes of title were made: Jerry J. Adelson, James W. Benfield and William H. Silverstein to Lecturers; Solomon L. Katz and Hans H. Neumann to Research Associates.

Resignations were submitted by Drs. Richard E. Goldberg and Raymond F. Johnson who accepted

appointments at the School of Dental Medicine University of Pennsylvania; Dr. David Blistein Dr. Frank Cacciola, Dr. Felix DiSanza, Dr. Ronald E. Genther, Dr. Allen Helfer, Dr. Edward Herzog Dr. Philip Silverstein and Dr. Paul Tannenbaum

Professional posts held and honors received by various members were: Dr. Frank E. Beube, Director and Vice President of the American Board of Periodontology; Dr. T. Mitchell Bundrant, Citizen Recognition Award of the American Legion Monroe, New York; Dr. Rudolph H. Friedrich member of Advisory Committee and Chairman Dental Subcommittee, Metropolitan New York Regional Medical Program; Consultant, Council or Hospital Dental Service, American Dental Association; Secretary, Section on Oral Surgery, Anesthesia and Hospital Dental Services, American Association of Dental Schools; Dr. Stephen F. Goodman, Trustee, Second District (New York) Dental Society; Dental Advisory Board, New York Dental Service Corporation; Dr. William Greenfield, Trustee, New York State Society of Oral Surgeons; House of Delegates, American Society of Oral Surgeons; Dr. Leonard Hirschfeld, Chairman, Public Information Committee, American Academy of Periodontology; Dr. Norman H. Joondeph, Vice President, Connecticut Society of Periodontists; Dr. Frances R. Karlan, Director of Dental Services, Metropolitan Life Insurance Company and member of Subcommittee on Dentistry of the Health Insurance Company; Board of Directors, American Association of Industrial Dentists; Dr. Austin H.

Cutscher, Chairman, Section of Pharmacology and Therapeutics, American Association of Dental Schools; Editor, Association of Pharmacology and Therapeutics Teachers in Dentistry; Consultant to Council on Dental Therapeutics, American Dental Association; Dr. Andrew M. Linz, Council of the International Association of Oral Surgeons; Mrs. Patricia A. McLean, President, American Dental Hygienists Association; Dr. George A. Minervini, President, Ninth District (New York) Dental Society, Man of the Year Award, Westchester County B'nai B'rith; Dr. Bernard S. Moskow, President, New Jersey Society of Periodontics; Dr. Alvin L. Solomon, Vice President, Eleventh District (New York) Dental Society; President, New York State Dental Society of Anesthesiology; Dr. Clifford L. Whitman, President, Middle Atlantic Society of Orthodontists; Dr. Edward V. Zegarelli, Board of Directors and Professional Education and Grants Committee, American Cancer Society, New York City Division, Chairman, Committee to Study Care and Management of the Oral Cancer Patient; Vice Chairman, Council on Dental Therapeutics, American Dental Association; Chairman, Committee on Examination Development, Board of Dental Examiners, State of New York.

Dr. Melvin L. Moss delivered the Northcroft Memorial Lecture to the British Society for the Study of Orthodontics in London. He also lectured at the Queens University, Belfast, Northern Ireland.

The teaching program during the academic year 1967-1968 was conducted with only minor changes from the previous year. Courses for Dental Hygienists reinstated the clinical clerkship program at The Roosevelt Hospital.

A grant of \$25,000.00 has permitted the expansion of the school's cancer teaching program. The clinical conferences have been extended and correlation lectures bringing together all of the aspects of diagnosis and management of head and neck cancer have been instituted as the first steps in the program.

Two second year students were assigned to Queens Hospital Center for the summer in the Student Research Fellowship program, and all second year students were offered two week voluntary clinical clerkships at the center. The results of these two programs have been very exciting in terms of student enthusiasm and the learning experience gained.

The Hospital Dental Service continued to render maxillofacial rehabilitation to patients of the Presbyterian Hospital as well as a limited amount of routine prosthetic rehabilitation to hospital patients.

In the past year the number of patients cared for by the Hospital Dental Service was 156. Of these 9 were in cleft palate rehabilitation, 13 in maxillofacial rehabilitation, 1 in operative dentistry, 33 in orthodontics, 22 in pedodontics, 17 in periodontics and 61 in prosthetic dentistry.

The Orthodontic Clinic, under the direction of Dr. Nicholas A. DiSalvo, provided 6,972 patient visits. Of these 574 visits were made by patients of the Vanderbilt Clinic. 268 consultations were afforded and the number of orthodontic patients receiving active orthodontic treatment averaged 421 throughout the year, each patient making approximately one visit every three weeks. In addition about 30 patients were seen on an observation basis at varying periods during the year.

There were 172 patients of The Presbyterian Hospital who were provided consultation and given oral surgical care by the Division of Oral Surgery. The clinic provided oral surgical consultation and care on requests from the clinics of Vanderbilt Clinic to 2,326 patients. The clinic rendered consultation and oral surgical care to 2,894 patients referred from the undergraduate clinics of the dental schools.

The Pedodontics Division conducted two active programs of clinical teaching. In the Children's Clinic, which is conducted mainly for undergraduate activity 135 children from 2 to 10 years of age were admitted for complete diagnosis and treatment. There were 1,185 visits, and a total of 1,633 completed procedures and treatments with an average of 1.4 treatments per visit. Of these, 80 involved pulp management procedures necessary to save extensively decayed children's teeth which otherwise might have been condemned to extraction and premature loss. About 20% of the children in this activity were very young children with severe dental problems assigned to first year postgraduate students in pedodontics; the remainder were assigned to fourth year undergraduate students. In the Cerebral Palsy Dental Clinic, devoted entirely to postgraduate clinical training and research, 287 patients with cerebral palsy and other handicapped conditions were admitted for complete dental care. There were 968 visits and 2,276 completed procedures and treatments, with an average of 2.4 procedures per visit.

During the past year 318 patients were treated in the Prosthetic Section and of that number 42% were Dental School patients and 58% were referred from Vanderbilt Clinic. 35% were handled through the Hospital Dental Service of the Presbyterian Hospital.

At the request of the New York City and New York State Health Department, two courses were given for the dental administrators of the Medicaid program. These courses were devoted to modern concepts of dental practice and constituted the continuing educational requirement for these administrative dentists who are responsible for authorizing treatment and authentication for payment under the Medicaid program.

Research in progress in the department continues at a relatively strong pace considering the limitation of space and facilities. Drs. Kutscher and Zegarelli, together with other members of the stomatology staff are continuing their clinical investigations to determine the effectiveness of unmedicated and medicated long lasting lozenges in the management of a group of erosive and ulcerative diseases of the mouth. Present and projected studies include the utilization of higher dosages of prednisolone in the case of the more resistant diseases.

Collaborative clinical investigations utilizing this same formulation and/or other formulations (un-medicated, nupercaine, bacitracin, mycostatin, etc.) have been initiated or are projected for several other departments of our medical center including dermatology, general surgery, otolaryngology, allergy and radiotherapy.

Studies are also continuing in efforts to more precisely determine the protectant action of un-medicated long lasting lozenges, in which the ingredients serve as surface coatings over erosive and ulcerative lesions of the mouth. In addition, interest continues in regard to discovering and evaluating other substances and materials, hitherto unused for these purposes, which might serve as better or improved vehicles and protectants.

The research members of the stomatology staff are continuing their clinical investigations of certain challenging diseases of the oral mucosae whose etiology, pathogenesis, and adequate management elude documentation. More suitable means for differentiating these similar appearing diseases and more effective treatment approaches are being sought. The diseases include recurrent ulcerative stomatitis, erosive lichen planus, erythema multiforme and chronic benign mucosal pemphigoides.

In collaboration with Drs. Harold Jacox, Chu H. Chang and Patricia Tretter of the Radiotherapy Section of the Department of Radiology, clinical investigations are being continued to determine the type and frequency of oral sequelae resulting from radiotherapy administered in the treatment of mouth cancer. Various therapeutic approaches for con-

trolling oral moniliasis and mouth dryness which frequently result from radiation are included in these studies.

Drs. Kutscher and Zegarelli are also working with Drs. Bernard Schoenberg and Arthur C. Carr of the Department of Psychiatry in efforts to determine the clinical picture (signs, symptoms, personality index, etc.) which may be used as a basis for diagnosing psychogenic and psychosomatic illnesses affecting the mouth and jaws. Of particular interest in these studies are patients suffering from glossodynia, atypical facial neuralgia, recurrent ulcerative stomatitis and lichen planus.

Dr. Weinstein is continuing his studies of gingival fluid.

Dr. Zengo is currently involved with investigations on salivary chemistry and the bioelectrical effects in bone.

Dr. Wotman is continuing his studies of the composition of saliva in patients suffering from primary aldosteronism and other hypertensive diseases. He is also studying the submaxillary salivary composition in patients suffering from cystic fibrosis and is collecting data on the composition of the saliva of the heterozygote parents of these children. In collaboration with Dr. Norman Kahn (Pharmacology) and Dr. Mero R. Nocenti (Physiology) Dr. Wotman is studying the effects of adrenergic agents and the sympathetic and parasympathetic electrical stimulation on the saliva composition of the cat.

Under the supervision of Dr. Di Salvo and various members of the staff, postgraduate students completed the following projects: roentgenographic cephalometric appraisal of vertical response to Begg therapy: qualitative and quantitative; continuation of Curve of Spee Leveling Appliance (Cosla); the influence of Begg therapy on the position of point A; a post-retention study of orthodontic cases; an electromyographic study of the swallowing process; morphology of the cranial base; relationships between the pterygo-maxillary fissure and the anterior border of the ramus; the correlation of anterior vertical dimension (ANS to M) with overbite; the correlation of genetic influence and of incidence of malocclusion, and the tweed triangle in class I untreated occlusion with good facial profile.

Drs. Koster and Rosenstein continued their study of oral disorders resulting from muscular incoordination or lack of muscle control in children with cerebral palsy involving the head and neck. Dr. Rosenstein continued his study on rampant decay in young children and its relation to early feeding

habits. Drs. Rosenstein and Marvin B. King continued their clinical study on the feasibility of extensive dental procedures for older patients with cerebral palsy and reported on the benefits of dental rehabilitation for these patients. Drs. Rosenstein and Kutner continued evaluation of findings in their long range clinical studies on conservation of children's teeth. The scope of these studies has been enlarged to include measure for treatment and conservation of teeth with extensive pulpal and bifurcation involvement. Drs. Rosenstein and Rosenberg continued their study of problems of tooth guidance and space management in the developing dentitions of young children, where premature loss of teeth occurred as a result of early rampant decay.

The following projects were completed by the second year postgraduate pedodontics students in partial fulfillment of requirements for the Certificate of Training in Pedodontics: an evaluation of occlusion disorders in 20 spastic cerebral palsy patients, by Dr. Earle R. Bassett; standardization of a new minor salivary gland collecting procedure for the diagnosis of cystic fibrosis (a preliminary report) by Dr. Neil B. Epstein; the child's perception of the dental operatory in relation to anxiety and behavior, by Dr. Eliot Lable; the panorex in pedodontics, by Dr. George P. Maty; dimensional characteristics and developmental changes in the dental arches in the primary and mixed dentitions in spastic children, by Dr. Cengiz Oktay.

Drs. Beube, Wasserman, Arnold Geiger, and Robert H. Thompson have received a supplementary grant from National Institutes of Health to correlate their data on the relationship of occlusion and periodontal disease. Drs. Beube, Schwartz and David Monahan have completed their study on the effectiveness of the electric toothbrush on orthodontic patients. Dr. Monahan is also investigating bone regeneration in periodontal disease.

Dr. Algus is continuing his research on the pH of periodontal pockets. Dr. Berman is investigating the effectiveness of cancellous bone grafts to the

alveolar process. Dr. Goodman is studying the role of the plaque in periodontal disease.

Dr. Ellen N. Hosiosky is continuing her study of the oral effects of tetracycline therapy. Dr. Melvin Morris is continuing his studies on the inductive properties of cementum and dentin.

Dr. Moskow is investigating the pathogenesis of periodontal lesions and the tooth and jaw morphology in the mongolian gerbil. He is also investigating the calculus attachment in cemental separations.

Dr. Odrich is investigating the use of cryosurgery in periodontal disease. Professors Oshrain and Salkind are continuing their investigations on the bacteriologic analysis of subgingival plaque and calculus.

Dr. Kenneth C. Deesen is continuing to broaden the applications of intra-oral photomicrography in teaching both the technic and clinical phases of Operative Dentistry. The visual aid library has been expanded as a result of these efforts.

Drs. Leavitt and Naidorf are continuing their investigation of the diffusion of radioactive formocresol as an endodontic medicament.

Dr. James W. Benfield is investigating methods for the prevention of porosity in dental gold castings.

Drs. Edward A. Cain, Jr., and Thomas W. Portway and Roy Boelstler are continuing the investigation of the sealing properties and hardness of powdered gold as a restorative material in the human dentition.

Drs. Cain, Portway and Boelstler are continuing their investigation of the sealing properties and pulpal response in the human dentition of a new plastic restorative material.

Drs. Leavitt and Naidorf are investigating the comparison of several culture media for the support of the growing of aerobic and anaerobic organisms isolated from the infected pulps of the human dentition.

Dr. Fredric Goodman is investigating the interrelationship of endodontic problems to the periodontium in animals.

1968 Publications of Members of the Professional and Academic Staffs

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Reports of Women's Auxiliaries

The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. ALLEN F. MAULSBY, *President*

During the year 1968, the members of the Board of Women Managers have shared the enthusiasm and pleasure of the doctors and their assistants who have moved into the new addition to Babies Hospital and we enjoyed the fascinating and very informative tours of the new laboratories and offices provided for us. We have been conducted on fascinating and very informative tours of the new laboratories and offices. We are most interested in the long-range plans for Babies Hospital and hope to help in every way possible to make the completion of the new building and renovation of the present structure a reality.

Mrs. Orson Munn has served as our Treasurer. Our budget this year, consolidated with that of the Cribside Social Service Committee to effect a saving in bookkeeping, totalled expenses of \$63,458.49, of which \$35,061.65 was for Social Service salaries, \$7,172.00 for care of ward and clinic patients, and the remainder for medical relief, emergency nursing, summer therapeutic care, recreational therapy, volunteers, pediatric psychiatric clinic, and toys.

We have had outstanding gifts to the Development Fund, and my particular thanks are due to Mrs. Flagler Matthews, who has added to the fund established in memory of Dr. Linneaus E. LaFetra for the enlarged newborn nursery.

The following also contributed generously to the Building Fund in the past year: Anonymous, Barker Welfare Foundation, Beaupre Charitable Trust, Mr. and Mrs. August Belmont, Mr. John E. Bierwirth, Mrs. Neville J. Booker, Mrs. Charles P. Cooper, Sr., Junior Cotillion, Charles E. Culpeper Foundation, Inc., Mr. John P. Fay, Mr. Thomas C. Fogarty, Mrs. William E. Hill, Mr. and Mrs. James McCosh Magie, Mrs. Hayward F. Manice, Martha P. and Joseph A. Thomas Foundation, Inc., Vanneck Foundation and Mr. James W. Walker. Our total raised is now \$3,697,976.00.

The Emergency Nursing Fund cared for twenty-one patients at an approximate cost of \$22,586.00. To the loyal supporters of this great life-saving Fund we are deeply indebted.

We also wish to thank the many groups and individuals who gave so generously for our patients' Christmas cheer.

Mr. Jerry Smith of Kansas City lent part of his remarkable collection of 1001 antique toys to be exhibited at the Hallmark Gallery from October 15

through December 31 for the joint benefit of Babie Hospital and the Children's Mercy Hospital of Kansas City. We want to thank him especially for the pleasure we had seeing his toys and for the \$3,629.23 which was raised for our benefit.

Resignations were accepted with regret from Mrs. Rollin Browne and Mrs. Ronald F. Dick. Mrs. J Taylor Howell has transferred to Associate Membership.

Mrs. William E. Hill again served as Chairman of the Cribside Social Service Committee, and we wish to record our thanks to her and to Mrs. K Herluf Trudso, Chairman of the Thrift Shop Committee. More than \$18,000.00 was raised, and we are grateful for all the work that this represents as well as for the \$2,000.00 contributed to the Emergency Nursing Fund.

Mrs. Bradley I. Collins, our Recreational Therapy Chairman, has kept us up to date on the activities of this busy Department—15,946 patient contacts have been made. Miss Ruth Vickers, Director of the Department for 13 years, retired on April 19. We all enjoyed a tea given in her honor on that date. She is greatly missed, but we are fortunate to have such a charming and effective successor, Miss Cynthia Lepore. Many gifts of toys and books as well as money have been received for this Department, for which we thank Mesdames Braga, Rose Collins, and the Magnavox Corporation. The Children's Art Show, which ran for ten days, was a resounding success enjoyed by many visitors.

Mrs. Iredell W. Iglehart served very capably as Group Leader of the United Hospital Campaign Drive, which raised a total of \$24,752.35. Mrs. John J. Weinberg's fine work as Chairman of Book Week netted \$605.00. Mrs. Casimir deRham and Miss Hope Kingsley lead the Honor Roll for their outstanding work, and Honorable Mention went to Mesdames Collins, O'Neill, Tilney and Walker for their efforts.

This report would not be complete without acknowledging the contribution made by our corps of volunteers, who gave 16,264 hours during the year. These unsung heroes tread our corridors day and night transporting patients, charts and x-rays. On the recreational floor they train the youngsters in the field of music, arts and crafts.

One of the highlights of our year was the Annual Luncheon held in November. Over thirty member

tended with Mr. R. N. Kerst acting as host and guest speaker. Following the luncheon Dr. James Wolff conducted the members on a tour of the new building and gave an inspiring talk on the work being conducted in the Hematological Research Laboratory.

Another memorable occasion was the Dolls Tea Party held in the Rustin McIntosh Conference

Room on December 20th. The display of dolls and the doll house was more enchanting than ever.

In closing I want to express my heartfelt thanks to Mr. Augustus C. Long, Mr. Alvin J. Binkert, Dr. Edward C. Curnen, Jr. and Miss Elizabeth R. Callahan for their understanding, wise counsel and guidance. I also want to thank our entire Board for their ready support and interest, all of which is of great benefit to me and to the Hospital.

Cribside Social Service Committee

MRS. WILLIAM E. HILL, *Vice President*

On behalf of the Cribside Social Service Committee of the Board of Women Managers of the Babies Hospital, it is my honor to submit this report.

As its share, the Cribside Committee allocated \$400 toward the seminars which were being conducted for the Social Service Staff during 1968. Our greatest expenditure goes toward our Social Service worker's salaries, of which we paid \$35,061.

Our committee has continued to help families of our children with Thanksgiving and Christmas gifts. We have provided camp care during the summer, sending 163 children on vacations of not less than twelve days, for which we have paid \$3,750.00. This amount was supplemented by parents' contributions of \$450. This summer change greatly benefits the children and helps them in learning to get along with other children, their teachers and their families.

On December 20th, the wives of the Resident Staff combined their efforts with Dr. Dean Martin and his clinic staff in giving a Christmas party for the out-patient clinic children. Our committee donated \$150.00 toward this project.

We were pleased to join with the other Social Service Committees in sponsoring the Spring Social Service Program which presented the play for living "To Temper the Wind."

We have contributed \$2000 to the Emergency Nursing Fund.

We have also approved the use of our Endowed Beds for 10 needy and deserving patients this year.

The success of our part in Everybody's Thrift Shop helps us to make these expenditures. We are particularly grateful to our Thrift Shop Committee which, under the able direction of Mrs. K. Herluf Trudso, has brought in the gross receipts of \$18,478.36. Mrs. Trudso has given unstintingly of her time and it is because of her, and the efforts, patience and enthusiasm of Mrs. John Bochow, Miss Hope Kingsley, Mrs. Herman Hoops, Mrs. Willard Austin, Mrs. Franklin Griffin, Miss Ethel Donaghue Mrs. Felix Pierot and Mrs. Thomas A. Buckner, that the Shop is doing so well. We are also most thankful to those on our Board and their friends who have faithfully contributed rummage through out the year.

The United Hospital Fund and the Greater New York Fund have given us a total of \$15,484.

The Lenten Sewing Classes brought in \$457 and a large supply of infants sweaters and receiving blankets which are carefully distributed to needy babies.

We wish to thank the Theodore Schulze Foundation for their generous contribution to be used for our children without restriction.

I am most grateful and wish to express my appreciation to the Committee Members of the Board of Women Managers, to the administration and especially to Miss Agnes D. Dilworth and the Social Service Staff of the Babies Hospital for their helpful guidance, hard work and loyal support.

The Mary Harkness Auxiliary

MRS. DAVID A. W. WILSON, *Chairman*

The Mary Harkness Unit has had its busiest year and the Auxiliary has enjoyed growing with the Unit. Last year we established a volunteer program which has become most successful — enabling volunteers to understand the problems of extended care. It has been rewarding to work with the fine members of the staff headed by Miss Margaret Del Mar, Unit Manager, and Miss Hilde Verberg, supervising nurse.

Finding entertainment for the patients has been another project. Mrs. James Worcester has been responsible for providing a weekly movie. With the help of Mrs. George Haley many letters were sent to various entertaining groups. We have had to cope with all sorts of problems, including personally transporting a twenty piece mandolin orchestra from Yonkers to and from the Unit. We want to thank the Westchester Mandolin Orchestra who gave a wonderful performance on the terrace in May, and also thank the Rye Girl Scouts, The Grace Notes of Greenwich, the New York Telephone Company, Mr. and Mrs. Chadbourne, and many others who have promised further entertainment for the Unit.

The Auxiliary has provided clothing for needy patients at times, plus games, books, periodicals and pictures. We have purchased a handsome cupboard-

on-wheels to house the Country Store so that it may be moved around the Unit. Our thanks to Mrs. George Gibbons and Mrs. Harold Barker who have kept the volunteer schedule operating smoothly. We are grateful to Mrs. Robert Frisch who has been so reliable in helping Mrs. Susan Millman, director of the Occupational Therapy Department.

The highlight of our year was the Christmas party when the young members of the Westminster Choir, Presbyterian Church, Rye, presented their Christmas program after which Mrs. Dorothy Pryor, Unit Food Manager, served a superb Christmas punch party, shared by carolers and patients. Stanley Muzoleski and his staff decorated the outdoor trees and lamps which blazed a warm welcome. On Christmas morning each patient received a gift purchased by Mrs. Thatcher Brown and Mrs. Robert Archer.

We welcome two new members, Mrs. Laurence Saylor and Mrs. Duncan Finlayson.

In closing I'd like to mention that the journey to attend Mr. Binkert's luncheons has always been rewarding, bringing us closer to the Medical Center. I am grateful for the privilege of having worked with each member of our Auxiliary and wish to express my appreciation to them.

Neurological Institute Auxiliary

MRS. IRVING B. KINGSFORD, JR., *Chairman*

This has been a busy and productive year. We are especially pleased with the enactment of several programs and the expansion of others. In total, we spent or contributed \$93,681 in furthering the goals of the Institute.

In the Social Service Department two supervisory level workers were hired on a part time basis. Mrs. Claire Bennett ran a pre-professional training program and Mrs. Harriet Dalin coordinated a study of community resources used by the Department. The latter program has led to a continuing community resource and liaison program. Appropriations for these projects were made by the Auxiliary from the Helen L. Weinberg Fund.

The fine Neurological Institute booklet, written by Mrs. Carl Chadsey, Jr., has been printed and distributed. Mrs. Chadsey and Mrs. Richard Newton revised and expanded the Thrift Shop list and, together with Mrs. Edward Gardner, Jr., designed an attractive appeal and tag combination to promote rummage for the Shop. The first mailing was a success and everyone welcomed the new approach.

Mrs. Royall Cannaday and her Thrift Shop committee have outdone themselves this year. They have netted \$23,730.06, more than \$10,000 over last year. Our congratulations to Mrs. Sannaday and to Mrs. H. Houston Merritt, Mrs. Frederick Borch, Mrs. Charles Stroud, Mrs. Everett Hoskins and Mrs. Richard Newton of the Auxiliary. We are also indebted to Mrs. Florence Lewis, Mrs. John Bates, Mrs. A. H. Rowan and Mr. Henri Femery who have helped with such enthusiasm.

In April the Neurological Institute had a theater benefit. The evening was a great deal of fun and highly successful. The sign on the theater, featuring Joe Grey in "George M", read "Sold Out" and we netted \$12,696.65. Our many thanks go to the co-chairmen, Mrs. John Weinberg and Mrs. Carter Burgess.

Mrs. Charles Adams and Mrs. H. McLeod Riggins have again been co-chairmen of the United Hospital Fund. They have worked assiduously and collected \$23,500 of the \$25,500 goal. The effect of the loss of a few important previous donors could not be completely overcome, but every effort was made to reach the amount. Our thanks to Mrs. Adams, Mrs. Riggins and the entitre committee. In addition, Mrs. Adams was again almoner for the Havens Fund.

In 1968 we gave \$30,575 toward basic Social Service salaries and an additional \$640 for college student to work in many of the Social Service programs during the summer. This exposure should help develop interest and understanding of Social Service work at colleges.

Medical Relief expenditures amounted to \$2,114.40 this year. The Auxiliary also undertook the expenses of social service staff development seminars which amounted to \$750.

The Emergency Nursing Fund, under the able supervision of Miss Catherine Gallagher, has again paid for extra nursing. This care is provided quickly when necessary and when other financial help is not immediately available. The Auxiliary gave \$3,000 to this fund in 1968 and our thanks go to Miss Gallagher for the excellent use she has made of it.

The Milbank Library received \$5,237.77 from the Auxiliary. Our Library chairman, Mrs. Rollo Masselink has done a superb job in helping to coordinate the library and, in addition, visiting patients with the book cart. The cart goes to all patient floors of the entire medical center twice a week.

The Volunteer Department received \$1,900 from the Neurological Auxiliary in 1968. Under the direction of Mrs. Diamond we have more volunteers than ever in Neurological Institute and they form an essential group. The patient escort service is fully used. Recreational assistants, Red Cross nurses' aides, junior nurses' aides, laboratory assistants, book cart assistants, clerks and messengers are all of great service and in total, 95 volunteers gave 13,990 hours in Neurological Institute this year.

The Recreational Therapy program, under Mrs. Shelly, is going well. Mrs. Arlene Katz spoke to the Auxiliary in December and amazed us with the variety of attractive pillows, place mats, decorations, wallets, etc., that could be made for very little cost for material. The patients prefer to pay this amount themselves and the Auxiliary with the Presbyterian Auxiliary pays Mrs. Katz's salary and has appropriated money for an assistant.

The summer camp program was a great success and 59 children went to 8 camps at a cost of \$16,355.22. The Big E gave \$12,000 to send 40 children to Camp Crystal Run. The Havens Fund appropriated \$125 of its \$400 gift for the program. The Society for the Relief of Women & Children gave \$600 and the Neurological Auxiliary contributed \$3,115.22.

The Auxiliary voted to support a doctoral scholarship at a cost of \$2,650. This stipend was granted to Mr. Alan Gruber, a doctoral student at the Columbia University School of Social Service. He will study ways of improving services to patients and will work closely with Miss Jean Collard who heads Neurological Institute's social service. We feel his findings will be of great interest. Our appreciation goes to Miss Collard for her dedication and for her ever thoughtful regard for the social service programs and the direction her department should take.

One new member has joined the Auxiliary this year: Mrs. Richard L. Masland, whose husband was appointed Director of Neurological Institute. We are delighted to have her with us.

The Residents' wives have started their own group and we gave them \$100 for their Babies Hospital Party with our good wishes. Four Auxiliaries gave \$20 each for a social service tea and play which took place in the spring. Dr. George H. Humphreys II spoke afterwards about the role of social service in the future.

Mrs. Lawrence Pool has again given her time and ingenuity to the House Committee. New curtains have been hung in the lobby, and the visitors' rooms on the third through seventh floors have new rugs as well as new curtains.

In the spring, Dr. H. Houston Merritt spoke to us about the excellent new operating suite in Neurological. Its facilities permit essential physiological studies while operations are being performed. He also brought us up to date on the building program. He informed us that about 60 doctors trained at

Neurological Institute have gone to the staffs of other hospitals. Of these, 15 have become chairmen of their departments. Mrs. Merritt arranged a delicious lunch after the meeting.

In the fall, the new director of Neurological Institute, Dr. Richard L. Masland, spoke to the Auxiliary. He told us of the magnitude of service responsibility — 3,245 patients were admitted in 1968. There were 16,000 clinic visits. Scientific leadership was given Harlem Hospital and we have a broad and outstanding research program. He also spoke of the remarkable results from the drug L-Dopa in Parkinsonian patients.

Mr. Binkert's lunches throughout the year have been most interesting and educational. We have all enjoyed them thoroughly.

As this report goes to press, Miss Catherine Gallagher who has been Unit Manager for the Institute for many years, will be on the verge of retirement. Her service to patients, staff and to the Auxiliary has been limitless. Her intuitive ability to perceive problems before they develop has been one of her greatest attributes. No request that we have made of her has gone unanswered. We will miss her and wish her all happiness in the future.

My thanks go to the Auxiliary, the administrators and staff who have been so helpful during the past three years. I have fully enjoyed working with all departments I came in contact with, and I'm most grateful for the support and guidance given me by the administration. My deepest thanks go to all Auxiliary members. Their time, energy and ingenuity have made it possible to enrich and enlarge our many projects which serve the hospital.

Women's Auxiliary of the New York Orthopaedic Hospital

MRS. JARVIS J. SLADE, *Chairman*

During 1968 the Auxiliary had a most interesting and active year.

Our meetings have been well attended, and they have been varied and informative. In March, Mrs. Spann, the supervisor of Social Service, spoke to us relating interesting case histories. We were delighted subsequently to work with the Social Service in conjunction with other Auxiliaries, to support a playlet on May 2nd, which illustrated the ways in which Social Service workers operate within families. This "Play For Living" was followed by a tea and the afternoon was constructive and enjoyable.

Our May meeting was held at the United Hospital Fund headquarters, and in December we were very fortunate in having Dr. Harold Dick speak to the board on the "Halo Treatment" presently being given a young Puerto Rican patient who suffers from scoliosis curvature of the spine.

At all of our meetings informative reports were given by Miss Rosemary Hoynak, our head nurse, or her associate, Miss Hester Brown: our two recreational therapists, Mrs. Doris Lagergren and Mrs. Eva Hoffman, spoke to the board regularly. Miss Elizabeth Prichard, Directors of Social Service, kept the Auxiliary advised regarding our Social Service Department.

We are so sorry to lose Miss Hester Brown, who after 32 years with the New York Orthopaedic Hospital retired as of January 1, 1969.

The Luncheons for the Auxiliaries given by Mrs. Binkert were most enjoyable and of great value to Auxiliary members. They help create a greater understanding of the commitments and needs of the Medical Center as a whole.

We report with great sorrow the death of Mrs. Robert E. Carroll, a beloved member of the board, and past President. The Harriet B. Carroll Fund, an unrestricted resident loan fund to the New York Orthopaedic Hospital, was created, and the Auxiliary is happy to join in supporting it.

Mrs. Thomas Choate and Mrs. Edward B. Meyer were elected to the board, and Mrs. Shirley C. Fisk returned to active membership. The Auxiliary is delighted to have them and feels they will be a great addition.

The Budget for the year included support for the care of ward and clinic patients, salaries for two

recreational therapists, recreational therapy supplies, salaries for two occupational therapy aides during the summer, partial salary for an assistant librarian in the Milbank Library and contributions for running the department. The total expenditures of the Auxiliary for 1968 were \$26,472.49 which included \$8,789.00 for the ward and clinic patients.

All patients received Christmas gifts, and some clinic patients also received presents. At our meetings we always tried to respond fully to the varied money requests presented to us.

The Auxiliary's income is derived from the United Hospital Fund direct benefits, from donations of Auxiliary members and friends, from the Mary E. Secor Trust for use in recreational therapy for children, and from an annual payment by the United Hospital Fund and the Greater New York Fund.

The Auxiliary wishes to express its great appreciation for the gifts received during this period from Mrs. Carl Lagergren and the Coats and Clark Company.

Mrs. William Hutton most generously donated an air-conditioner to the Hospital. Many toys and gifts for the playroom were donated or purchased during the year. Parties for the patients were given at Halloween and Christmas. This past summer the board once again financed two occupational therapy aides as part of the recruitment program the United Hospital Fund sponsors.

The United Hospital Fund got well under way early in the fall under the able leadership of Mrs. Edward H. Gerry, as group leader, and Mrs. Gerry and Mrs. A. Neil Lilley as team captains. The Auxiliary raised \$35,090 and will receive \$15,010 in direct benefits. Mrs. James O'Malley was the board's Chairman for Boxweek and \$371 was raised.

Mrs. Thomas Hitchcock is the Chairman of the House Committee. Mrs. Sheldon Whitehouse is our almoner to the Haven's Relief Society, and keeps the Auxiliary informed on the interesting cases being presented to her.

The board is particularly grateful to Mrs. Willis Rease for her efforts in the excellent reconstruction of the Isolation Unit.

Mrs. John R. Condliffe is our Committee Chairman on the Volunteer Committee, and Mrs. Charles

3. Grosvenor represents the Auxiliary on the Milkbank Library Committee. Mrs. George Johnston is the Auxiliary representative on the Nursery School Board.

Mrs. Sheldon Whitehouse and Mrs. Edward Gerry

are members of the Board of Trustees.

I want to thank the Auxiliary for making this a constructive and stimulating year. Also, I wish to express my great appreciation to the administration and staff for their constant aid and interest.

Women's Auxiliary of the Presbyterian Hospital

MRS. ARTHUR GERARD DEVOE, *Chairman*

As a representative of the Women's Auxiliary of the Presbyterian Hospital, it is my great privilege to be able to report an expansion of its services to the hospital. This has come about not only because of well-directed effort by a vital group of active members but due also to increased response from friends of the Auxiliary and the Hospital. We thank them from the heart and hasten to add — we depend on them for the future.

It is encouraging to report a total income in 1968 of \$74,614, representing an increase of \$23,000 over the receipts from last year. This made it possible to donate \$26,977 to the care of Ward and Clinic Patients, as well as to include in our budget \$5,580 for a Liquid Scintillation Flow Monitor and Pump requested by the Surgical Metabolism Research Laboratory, an addition of \$3,700 to the present Recreational Therapy Program, \$1,000 to The Special Nursing Fund, \$1,000 to the Emily Webster Fund, \$1,800 to the Social Service Department and support for many smaller requests.

In the Milbank Library, the Auxiliary continued to sponsor improvements. A new book shelf unit for the Library Annex was installed in May and 22 new titles were added to the Large Print collection through the use of the Roy Manny Fund.

A large number of excellent book and paperback donations have increased our permanent collection and insured a good book sale at Christmas time. The R. C. A. company donated many brand new records, also to be sold.

The Library for the Blind has supplied eight new phonographs for use in the Eye Institute "Talking Books Program." The new models are transistorized, lighter in weight, and have more convenient controls. This program is constantly growing. Our one volunteer, Miss Smith, is responsible for a great deal of this increase. About 750 record sets have been distributed this year. More volunteer help for this program is badly needed.

In October of this year, Myra Monahan, the librarian, left to accept a position in the reference department of Boston College Library. Her work in improving our Library's collection, from mysteries to classics, was outstanding. We were fortunate to have Mrs. Nancy Buchler, a former library staff member, return to take Miss Monahan's position.

The Recreational Therapy Program which was started last year in conjunction with Neurological Auxiliary, is now well established with a most competent director, Mrs. Arline Katz. Our members were impressed with her explanation of the work she is doing with patients and a showing of some of the artistic articles made by patients under her direction. We have been impressed with the interest and assistance given to this program by Mrs. Shelley, Director of Occupational Therapy. Our two Auxiliaries are hoping to support an assistant in the coming year to extend the fine work Mrs. Katz is doing. Requests for her services go far beyond her ability to serve them. We hope also to interest more volunteers in this program. She now tries to cover two floors out of the seven that might be serviced.

The Stuyvesant Square Thrift Shop at 81st Street and Third Avenue continues to make impressive sums for its six charities: two churches, two youth organizations and two hospitals (Lenox Hill and Presbyterian). Under the dedicated guidance of our chairman, Mrs. Robert S. Grinnell, a small group of interested and very faithful members of the Auxiliary give a great deal of their time to this project, far beyond the call of duty, and are responsible for its amazing success. The officers want to thank them for this contribution. Also we thank our members and other friends of the Auxiliary for their donations of quality which come in all the year round. With the present rise in the standard of living more people can purchase bargains in our shop. During the last year we cleared \$31,718 for the Auxiliary which allowed us to support many projects at the Hospital. Our Fall Fashion Show makes a very important contribution in this area. This year it was held at the St. Regis Roof and featured Mr. Ferdinando Sarmi who was there in person to describe his Fall Collection to about three hundred guests. The publicity in the "Times" boosted our Shop with a picture of the Shop window and some interesting merchandise. Mrs. Richard B. White was Chairman of the Benefit assisted by Mrs. Richard De L. Simmons and Mrs. Hamilton Southworth among others.

The Volunteer Department wishes to congratulate Mrs. Louis Augustus, Mrs. Janet Monroe and Miss Marjorie Peto for their excellent indoctrina-

ion and instruction of volunteers. The new Director, Mrs. Dorothy Diamond, remarks that volunteers can serve only as well as they are trained and he is happy to have been able to furnish the newly organized Recreational Therapy Program with four volunteers during the year. She sincerely hopes to increase this number in the future as the need has now been demonstrated.

The Social Service Committee was pleased to have helped initiate what the Social Service Director, Miss Elizabeth Prichard and her staff considered the outstanding event of the year for the department. The "Patient Planning Program" was held on May 2nd and was made possible by the planning and financial support of all the Women's Groups. Mrs. Harold D. Harvey was chairman of the committee which included Mrs. William Hill, Babies Hospital; Mrs. Irving Kingsford, Neurological Institute; Mrs. Jarvis Slade, New York Orthopedic Hospital. The joint undertaking made possible an educational and informative program for the Social Service Staff, members of the Auxiliaries and representatives of community agencies. A production "To Temper The Wind" given by "Plays for Living" illustrated the contribution that a homemaker can make during hospitalization of a mother. The highlight of the program was the paper given by Dr. George Humphreys on "*The Medical Social Worker in the New Society*". This was so enthusiastically received by staff, committee members and visitors that copies were sent to those present and to those who were invited but could not attend.

Auxiliary funds made possible the continuation of training and staff development, primarily through a program of Case Seminars and again provided a college student with experience in social work by paying her salary for an eight week assignment in Group Clinic. The work of the almoners of the Haven Relief Fund Society enabled, as usual, the Social Service Department to provide for special patient needs. Reports on nursing homes from the Community Council are increasingly valuable in affecting and expediting nursing home plans for patients. Four members of the Social Service Committee undertook these assignments. The Director of Social Service considers that the work and support of the Auxiliary and its Social Service Committee are invaluable and provide effective means — soundly integrated with the program of the department — for meeting its increased and complex responsibilities.

Mrs. Robert H. E. Elliott reports that the Student Nurses Scholarship Fund had their Tenth Annual Card Party and Tea in Maxwell Hall and realized about \$13,000 from the event. More than 125 stu-

dents have received financial aid as a result of this Party. Mrs. Frank Stinchfield was committee Chairman and aiding her were the following members of the Women's Auxiliary: Mrs. B. DeWitt Bleecker, Mrs. Stanley M. Bysshe, Mrs. Robert H. E. Elliott and Mrs. Edward B. Self. This Committee deeply appreciates the interest and support of the Women's Auxiliary. Our beloved friend, Miss Helen Hayes, was Honorary Chairman of the event and Honorary Sponsors included Mrs. Alvin J. Binkert, Mrs. W. Van Alan Clark, Mrs. Grayson Kirk, Mrs. Augustus C. Long and Mrs. H. Houston Merritt.

It gives us great pleasure to announce ten new Active Members this year: Mrs. David Andrews, Mrs. Emily Otis Barnes, Mrs. John M. Kinney, Mrs. Richard Kossmann, Mrs. Francis L'Esperance, Mrs. Charles Neer, Mrs. Truman Susman, Mrs. Richard L. White, and from Junior Membership: Mrs. Thomas A. Burke, Mrs. Richard De L. Simmons. Transferring to Associate Membership in 1968 were Mrs. F. A. Dewey, Mrs. Stephen B. Haynes, Mrs. Robert B. McGraw, Mrs. George Montgomery. Two members resigned: Mrs. George G. Tenney and Mrs. Grenville Garside.

We were truly saddened by the death of Mrs. Leicester Van Leer who had contributed so much to Auxiliary projects and expansion through the years. Our affection and thanks remain with her memory. It is also with deep regret that we record the death of Associate Member, Mrs. Otto B. Reimer.

Our speaker at the January Meeting at the Hospital was Dr. Richard J. Stock, Associate Attending Physician in the Medical Service. We felt most fortunate to hear about the extraordinary work being done in the Cardiac Monitoring Unit. Dr. Stock's ability as a teacher was illustrated by the picture he was able to give us of a functioning heart, normal and abnormal, and how the Unit was able to assist the doctor. We were pleased that we as an Auxiliary had been able to contribute to this pioneering work. After the meeting Dr. Stock took some of the members to see the Monitoring Unit. We were equally fortunate at the May Meeting to have Dr. Francis L'Esperance of the Eye Institute give us a fascinating history of development of the Laser Beam and its use in various areas of medicine. Dr. L'Esperance has been one of the pioneers in using the Laser. He ended his instruction about this incredible instrument by giving a demonstration of a Ruby Laser. Afterwards we enjoyed a delicious lunch as guests of Mr. Binkert. We always enjoy his enlightening discussion of hospital affairs.

In closing, I would like to thank the marvelous Chairmen of Committees who are the ones respon-

sible for the continuing expansion of Auxiliary activities. Regardless of the amount of help these members receive, they carry on and produce results that make us proud of our achievement. I am very much indebted to all of them. The departments of the hospital deserve a vote of thanks from me for their understanding and helpful instruction. Mrs. Shelley, Miss Prichard and Mrs. Diamond make it easy and pleasant for us to work with their depart-

ments. The Public Interest Department has contributed much to the smooth functioning of Auxiliary business. We would find it very difficult to operate without the constant assistance of Mr. Kerst's Office and the Accounting Department. I have enjoyed my association with all of them. It is a fine experience to work with an Organization and a Hospital with the "Esprit de Corps" that exists at Presbyterian. I have considered it a privilege.

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Appendix

EXHIBIT A

THE PRESBYTERIAN HOSPITAL

Balance

DECEMBER

ASSETS

	December 31	
	1968	1967
CURRENT FUNDS ASSETS:		
Cash	\$ 1,480,771	\$ 1,730,565
Investments — bonds, etc. — at cost (market value — 1968, \$1,165,395)	1,167,147	1,151,860
Accounts receivable (less reserve — 1968, \$423,996; 1967, \$387,906)	12,307,811	10,865,743
Supplies and materials — at cost	1,061,553	941,236
Interest accrued and dividends receivable	927,543	906,558
Prepaid expenses	70,304	69,934
TOTAL CURRENT FUNDS ASSETS	17,015,129	15,665,896
ENDOWMENT AND PLANT FUNDS ASSETS:		
Cash	414,954	1,812,343
Due from general fund	3,600,000	
Investments:		
Bonds and stocks — at cost or contributed value (market value — 1968, \$124,447,335)	95,464,718	94,750,255
Real estate — at cost less depreciation	8,560,064	7,321,605
Other	50,246	58,105
Property and equipment — at cost (less accumulated depreciation — 1968, \$24,661,984; 1967, \$22,696,620)	55,208,067	44,586,958
TOTAL	\$180,313,178	\$164,195,162

EXHIBIT A

THE CITY OF NEW YORK

et

BAND 1967

FUNDS AND LIABILITIES

	<i>December 31</i>	
	<i>1968</i>	<i>1967</i>
CURRENT FUNDS AND LIABILITIES:		
Accounts payable	\$ 3,004,760	\$ 2,529,806
Mortgages payable	2,595,577	1,941,904
Accrued payroll and other expenses	920,917	671,853
Due to plant funds	3,600,000	
Special expendable funds (Exhibit D)	2,725,943	2,730,543
General fund (Exhibit D)	4,167,932	<u>7,791,790</u>
 TOTAL CURRENT FUNDS AND LIABILITIES	17,015,129	15,665,896
 ENDOWMENT FUNDS (Exhibits D and E)	80,202,324	78,986,410
 PLANT FUNDS (Exhibit D):		
Replacement funds	25,337,016	22,665,428
Building funds	2,550,642	2,290,470
Capital invested in property and equipment	55,208,067	44,586,958
 TOTAL	<u>\$180,313,178</u>	<u>\$164,195,162</u>

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENT OF OPERATING INCOME AND EXPENSES

For the Years Ended December 31, 1968 and 1967

	<i>December 31</i>	
	<i>1968</i>	<i>1967</i>
OPERATING INCOME:		
Care of patients	\$47,261,672	\$41,635,648
Other services	3,586,852	3,713,429
Transfer from special expendable funds for research, educational and other purposes (Exhibit D)	2,140,564	1,990,892
TOTAL OPERATING INCOME	52,989,088	47,339,969
OPERATING EXPENSES:		
Administration	405,337	364,328
Assistant Secretary-Treasurer	632,287	438,903
Comptroller	1,871,351	1,372,619
Public Interest	219,871	200,238
Mary Harkness Unit	386,261	349,495
Non-professional services:		
Buildings and grounds	6,312,004	5,698,992
Food service	4,188,646	3,983,066
Personnel and protective	743,802	623,831
Other non-professional services	1,348,076	1,255,368
Professional services:		
Nursing	15,829,613	13,766,664
Professional staff, doctors' offices and research	6,856,634	5,687,951
Special services	8,365,982	7,381,426
Vanderbilt Clinic and other	4,192,832	3,576,635
Provision for depreciation	2,475,539	2,374,934
TOTAL OPERATING EXPENSES	53,828,235	47,074,450
OPERATING GAIN (LOSS)	(839,147)	265,519
OTHER INCOME:		
Investment income restricted for operating expenses (Exhibit C)	549,244	582,285
Contributions	618,092	590,313
TOTAL OTHER INCOME	1,167,336	1,172,598
NET OPERATING INCOME (transferred to general fund — Exhibit D) ..	\$ 328,189	\$ 1,438,117

EXHIBIT C

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF INVESTMENT INCOME

For the Years Ended December 31, 1968 and 1967

	<i>December 31</i>	
	1968	1967
INVESTMENT INCOME	<u>\$ 5,147,461</u>	<u>\$ 5,179,395</u>
DISTRIBUTION THEREOF:		
Investment Income Restricted for:		
Operating expenses (Exhibit B).....	\$ 549,244	\$ 582,285
Special expendable funds (Exhibit D).....	751,891	792,929
Replacement funds (Exhibit D).....	988,884	920,442
Building funds (Exhibit D).....	115,260	123,654
Investment income appropriated for additional facilities and equipment (Exhibit D).....	2,742,182	2,760,085
TOTAL	<u>\$ 5,147,461</u>	<u>\$ 5,179,395</u>

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1968 and 1967

	<i>December 31</i>	
	1968	1967
GENERAL FUND		
Balance, January 1	\$ 7,791,790	\$ 9,477,417
Add:		
Legacies and grants.....	187,886	300,401
Investment income appropriated for expenditures for additional facilities and equipment (Exhibit C).....	2,742,182	2,760,085
Proceeds from sale of real estate.....	1,299,607	
Blue Cross and Medicare rate adjustments for prior years.....	311,686	676,813
Net operating income (Exhibit B).....	328,189	1,438,117
	4,869,550	5,175,416
Total	12,661,340	14,652,833
Deduct — Expenditures for additional facilities and equipment.....	8,493,408	6,861,043
Balance, December 31	\$ 4,167,932	\$ 7,791,790

SPECIAL EXPENDABLE FUNDS

(For Research, Educational and Other Purposes)

Balance, January 1	\$ 2,730,543	\$ 2,359,552
Add:		
Legacies, contributions and grants.....	1,674,232	1,772,678
Investment income (Exhibit C)	751,891	792,929
Miscellaneous	1,560,726	892,405
	3,986,849	3,458,012
Total	6,717,392	5,817,564
Deduct:		
Transfers to:		
Operating income (Exhibit B)	2,140,564	1,990,892
Other funds — net	361,562	115,828
Expenditures for property and equipment.....	236,310	338,511
Miscellaneous	1,253,013	641,790
	3,991,449	3,087,021
Balance, December 31	\$ 2,725,943	\$ 2,730,543

ENDOWMENT FUNDS

Balance, January 1	\$78,986,410	\$76,394,908
Add:		
Legacies, contributions and grants.....	372,052	258,441
Gains from investments sold or redeemed.....	696,039	2,244,442
Transfers from other funds — net.....	147,823	88,619
	1,215,914	2,591,502
Balance, December 31	\$80,202,324	\$78,986,410

EXHIBIT D (*Continued*)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1968 and 1967

	December 31 1968	1967
PLANT FUNDS		
REPLACEMENT FUNDS:		
Balance, January 1.....	\$22,665,428	\$19,591,040
Add:		
Funding of depreciation.....	2,475,539	2,374,934
Investment income (Exhibit C).....	988,884	920,442
Gain from investments sold or redeemed.....	188,804	559,037
Transfers from other funds.....	71,118	
Total	3,653,227	3,925,531
Deduct — Replacements and rearrangements.....	26,318,655	23,516,571
Balance, December 31.....	\$25,337,016	\$22,665,428
BUILDING FUNDS:		
Balance, January 1.....	\$ 2,290,470	\$ 2,231,676
Add:		
Legacies, contributions and grants.....	2,984,106	611,977
Investment income (Exhibit C).....	115,260	123,654
Received from Columbia-Presbyterian Medical Center Fund, Inc.....	902,399	1,288,781
Transfers from other funds — net.....	213,688	(43,910)
Total	4,215,453	1,980,502
Deduct:		
Expenditures for property and equipment.....	3,950,346	1,921,708
Loss on investments.....	4,935	
Total	3,955,281	1,921,708
Balance, December 31.....	\$ 2,550,642	\$ 2,290,470
CAPITAL INVESTED IN PROPERTY AND EQUIPMENT:		
Balance, January 1.....	\$44,586,958	\$37,301,367
Add:		
Transfers from:		
General fund	8,493,408	6,861,043
Special expendable funds	236,310	338,511
Building funds	3,950,346	1,921,708
Replacement funds	981,639	851,143
Total	13,661,703	9,972,405
Deduct:		
Provision for depreciation.....	2,475,539	2,374,934
Disposal of real estate — net of accumulated depreciation.....	555,047	
Adjustment (net) of provisions for depreciation of, and additions to, plant and equipment in prior years.....	10,008	311,880
Total	3,040,594	2,686,814
Balance, December 31.....	\$55,208,067	\$44,586,958

EXHIBIT E

**THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
ENDOWMENT FUNDS**

December 31, 1968

THE PRESBYTERIAN HOSPITAL:

Adam, George Aubrey	\$ 3,314,131
Anonymous	271,844
Anonymous—For Support of Residency Training	127,079
Arnstein, Daniel G.....	344,988
Atchley, Dr. Dana W.....	1,317,992
Baker, Frances E.....	13,116
Baker, Mrs. Frederick, Pathological Department	11,964
Briddon, C. K., Gold Medal.....	3,444
Brookman, Henry D.....	70,370
Bruenn, Dr. Howard G.....	37,649
Cardiac Monitoring Fund of the Department of Medicine.....	82,273
Carle, Robert W., Endowed Room.....	247,015
Carle, Robert W. and Adele S., Endowed Room	57,984
Cary, Caroline Catherine	68,143
Cary, The, Endowment Fund.....	113,377
Coakley, Cornelius G.....	35,590
Coakley, Cornelius G., Memorial	506,562
Coakley, Louise Perry	367,462
Colgate, Hannah, Memorial	85,563
Collins, Perry McDonough	772,668
Columbia University for Vanderbilt Clinic and Sloane Hospital	1,925,823
Cook, William W.....	139,806
Cooper, Charles P. and Leonora P....	53,571
Cragin Fund	96,857
Davis, Isabel G.....	1,104,978
Delano, Moreau.....	5,629
Department of Surgery	80,763
Dodge, The Cleveland H.....	437,002
Dortic Memorial	139,368
Dows, Mrs. David	10,836
Dows, Margaret E.....	7,544
Educational and Scientific Work.....	401,856
Eichner, Joseph Herman and Hannah, in Memory of	12,070
Eidlitz, Otto M.....	578,829
Eidlitz, Robert J.....	261,375
Endowed Bed	2,897,570
Endowed Bed—Research	254,410
Eyc Pathology	10,306
Faulkner, The Edward Daniels Memorial for Study and Treatment of Arthritis	140,741
Feldman, Irving J.....	25,710
Fiske Fund	146,704
FitzGerald, Frederick H. and Josephine F.	191,122
Flagler, Alice Manderlick	350,473
Foote, Edwin Bancroft	247,633
Ford, George W. and Eliza Lawson..	465,729
Fowler, Dr. Edmund P., Memorial....	5,239
Fracture Endowment Fund	11,727
Fremstad, Anna Olivia	165,051
Frick, The Frances Dixon, Memorial..	49,379
General Endowment	1,747,446

Goldschmidt, Henry Philip	7,038
Gondran, Sophie M. and Adolph L.....	140,741
Griffith, Griffith W. and Mary Jones, Memorial	1,856,340
Haller, Maria L.....	3,672
Harkness, Edward S.....	8,710,183
Harkness, Edward S., Memorial.....	12,520,334
Harkness, Edward S., Research.....	1,009,429
Harkness; Mary Stillman, Memorial Endowment	334,950
Harkness, Mary Stillman, Memorial Research	62,074
Harkness, The Mary S., for Convalescent Care	1,411,698
Harkness, William Hale, Memorial...	53,900
Hartford, The John A. Foundation.....	415,382
Hirschewitz, Blanche M.....	86,319
Hill, Marguerite S.....	7,741
Honic, Louis M.....	24,201
Ingenthaler, May A., Memorial Bed..	30,417
Institute of Ophthalmology, The	4,803,419
Ives, Helen Douglas	159,243
James Foundation of New York.....	714,341
Jesup, Morris K. and Maria DeWitt..	140,741
Johnston, Andrew, Memorial Room...	57,176
Jones, David, Memorial.....	422,224
Jones, Margarete A.....	233,989
Keller Memorial	704
Kennedy, John Stewart	1,938,492
Kinnicutt, The G. Herman, Flower...	7,038
Knapp, The Herman Memorial Eye Hospital Endowed Bed.....	90,382
Kreisler, Harriet and Fritz.....	284,115
Krumb, Henry	29,192
Lattimer, Dr. John K.....	75,739
Lindley, Erasmus C.....	58,911
MacMillin, Isabel, Memorial.....	1,899,736
Maloy, The Frank and Selena, Memorial	29,455
Martin, Frederick Townsend	14,074
Maxwell, Anna C., Memorial Library.	10,091
McCosh, Dr. Andrew J., Memorial....	141,012
McCready, Jeanne Campbell.....	141,729
McGuire, Mary Madison	348,068
Medical Laboratory Development Endowment	272,100
Medical Scientific	500,753
Milbank, Dunlevy	1,159,681
Miller, James, Endowed Room.....	85,650
Miller, Margaret G.....	72,823
Montfort, Barret, Memorial, Scholarships	43,599
Morgan, Edward M., Endowed Beds..	54,132
Morgenstern, Morris and Celia, Research	11,446
Nathan, Garfield Arthur	307,065
Ophthalmological Research	103,450
Ottman, for Cancer Research	39,408
Parkin, Alice Temple	59,301
Prostate, Fund for Research.....	13,252

EXHIBIT E (*Continued*)ENDOWMENT FUNDS – *Continued*

Quick, The Walter R.....	20,647	Eichner, Joseph Herman and Hannah in Memory of	12,070
Research and Development in Anesthesiology	282,423	Endowed Bed	58,343
Research and Development in Department of Medicine.....	62,224	General Endowment	12,816
Richards-Courinand Library	1,007	Harkness, Edward S.....	1,688,579
Rogers, Henry H., Memorial	39,238	Harkness, Edward S., Educational and Scientific	844,448
Sage, Dean, Memorial	39,763	Harkness, Mary Stillman, Memorial Endowment	334,950
Sage, Dean, Scholarship	9,142	Kimball, Reuel B.....	81,261
Sage, Russell and Margaret Olivia, Memorial	815,001	Lambert, Dr. Charles I., Memorial.....	12,816
School of Nursing.....	288,353	Pratt, Samuel	56,053
Secor, Mary E.....	48,568	Rathbone, R. Bleeker	21,111
Sherry, The Bertha, Memorial	914,692	Rumson Fund	28,809
Sidman Trust	1,510	Urological Service Research.....	5,332
Sinclair, The Francis MacDonald, Endowed Room	53,304	Videre, Leontine, Foundation	14,034
Sinclair, The Jennie Hankinson Endowed Room	53,304	Wilcox, Herbert B., Memorial	3,447
Sloane Hospital	1,102,368		<u>3,203,591</u>
Sloane Hospital Babies' Alumni.....	31,603	NEUROLOGICAL INSTITUTE:	
Sloane Hospital Research.....	35,185	Blair Memorial	4,401
Sloane, The William, Memorial.....	908,847	Endowed Bed — Research	216,720
Society of the Alumni of Presbyterian Hospital	3,672	Neurological Institute Auxiliary	10,356
Soria, Henry J.....	108,625	Ogilvie, Clinton, Memorial	14,031
Squier Clinic	99,380	Schlesinger, Dr. Edward B.....	58,298
Squier Clinic Fellowship and Resident.	60,553	Zabriskie, Dr. Edwin G., Memorial...	140,075
Stein, Jules	37,553		<u>443,881</u>
Stevenson, Dr. Thomas W., Memorial.	29,013	NEW YORK ORTHOPEDIC HOSPITAL:	
Stilson, Ellen J. and Minnie	27,326	Bridgman, Statira	3,519
Stone, William Ridgley, Memorial.....	98,312	Carroll, Dr. Robert E., Research.....	20,691
Sturges, Frederick, Jr., Scholarship.....	64,246	Endowed Bed	873,109
Surgical Cancer Research	5,760	Farrell, Dr. Benjamin P., in Memory of General Endowment	10,130
Surgical Fellowship	84,444	Hallock, Dr. Halford, Fellowship.....	1,172,740
Taylor, Dr. Alfred S., Memorial.....	23,676	Hibbs, Russell A., Memorial Library..	16,058
Taylor, Sarah A. Hard, Endowed Room	61,772	Hurst, The Thomas D. and Kate.....	50,763
Terry, John T., in Memory of.....	57,376	Kane, Annie C., Fellowship.....	7,038
Thacher, Frances Lake, Memorial.....	19,827	Lantzounis, Dr. Leonidas A., Fellowship	1,407,412
Tod, J. Kennedy, Memorial.....	140,885	Orthopedic Surgery Endowment	15,355
Tolfree, The Caroline O. and James E., Memorial	221,487	Rathbone, R. Bleeker	164,097
Urological Service Research	105,991	Smith, Dr. Alan DeForest, Lectureship	21,111
Valentine, Isaac E., Memorial.....	792,682	Tower, Mary T., in Memory of.....	7,973
Van Norden, Kathryn L.....	3,672	Watson, Emily A.....	43,024
Vanderbilt Clinic	220,691	White, Emily Vanderbilt	3,521,705
Webster, Dr. Jerome P., Library of Plastic Surgery	76,014	Willard, Mary Livingston	27,877
Weinberg, Ruth F.....	189,778		<u>7,038</u>
Weinberg, The Sidney J., Employees Educational Aid	94,059		<u>7,369,640</u>
Weinman, Moses	7,544	TOTAL ENDOWMENT FUNDS.....	<u>\$80,202,324</u>
Weisl, Alice	400,417	TRUSTS REMITTING INCOME TO THE HOSPITAL	
Welles, Frances Swan	14,074		
Westlake, Emory H. and Caroline B...	38,228	Market Value December 31, 1968	
Wheeler, The Dr. John M., Memorial	104,821		
Williams, William	474,444	Cook, William W.....	\$ 238,344
	<u>69,185,212</u>	Danziger, Matilda	85,473
THE BABIES HOSPITAL:		Gould, Edwin	17,399
Cleft Palate Cases	10,060	Jackson, Peter A. H.....	423,057
Cribside Social Service Committee....	18,055	Smith, Charles S.....	1,211
Educational Therapy	1,407	Strong, W. E. S.....	675,102
		Swan, Helen M. W.....	1,216,181

ACCOUNTANTS' OPINION

THE PRESBYTERIAN HOSPITAL

IN THE CITY OF NEW YORK:

We have examined the balance sheet of The Presbyterian Hospital in the City of New York as of December 31, 1968, the related statements of operating income and expenses and of investment income, and summary of fund changes for the year then ended, and the supplemental schedule of endowment funds. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements and supplemental schedule present fairly the financial position of the Hospital at December 31, 1968 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HASKINS AND SELLS

Certified Public Accountants

New York

February 11, 1969

REPORT OF THE AUDITING COMMITTEE

TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL

IN THE CITY OF NEW YORK:

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board has chosen, with your approval, the firm of Haskins & Sells, as independent certified public accountants, to make an examination of the financial statements of The Presbyterian Hospital in the City of New York for 1968.

We submit herewith after due consideration by this Committee, an opinion of Messrs. Haskins & Sells dated February 11, 1969 relating to the Corporation's balance sheet as of December 31, 1968, the related statements of operating income and expenses and of investment income, and summary of fund changes for the year then ended, and the supplemental schedule of endowment funds. Your Committee recommends that the opinion and financial statements be accepted and approved.

JOHN A. GIFFORD, *Chairman*

JOHN S. BURKE, JR.

JOHN A. HILL

DORRANCE SEXTON

ROBERT WINTHROP

Auditing Committee

New York

February 12, 1969

EXHIBIT F

**GROUP RETIREMENT PLAN ESTABLISHED BY
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK**

The retirement benefits provided by the Hospital under its Group Retirement Plan are partly provided by a Trust Fund established with the Morgan Guaranty Trust Company of New York and partly insured by the Travelers Insurance Company. The amounts set aside for retirement benefit purposes, which are not a part of the assets of the Hospital, aggregated \$12,005,145 at December 31, 1968. Payments to the fund during 1968 were included in expense. In accordance with the Hospital's undertaking under the Group Retirement Plan the amounts already set aside are sufficient to provide for all retirement benefits to which employees now retired and employees now eligible to retire at their own request are or would upon retirement be entitled under the Plan. In addition, they include provision for that portion of future retirement benefits to employees not now eligible for retirement at their own request, which has been funded through December 31, 1968, under the systematic program followed by the Hospital in financing such benefits.

Following is the Trustee's report for the year ended December 31, 1968 on the Retirement Fund Trust established by the Hospital:

Assets in Fund – January 1, 1968.....	\$ 6,384,005
Payments to Fund	1,086,946
Net Income from Investments including Net Profit on Investments Disposed of.....	364,228
	7,835,179
Disbursements for Retirement Benefits.....	281,583
Assets in Fund – December 31, 1968.....	\$ 7,553,596
<i>Consisting of:</i>	
Industrial, Railroad, Public Utilities and Miscellaneous Bonds.....	\$ 1,996,115
Government Mortgages	130,510
Preferred Stocks	4,333
Common Stocks	3,591,334
<i>Commingled Pension Trust Funds:</i>	
Excluding Common Stocks	49,961
Mortgage – Real Property	995,877
Special Situation Investments – Bonds	448,036
Special Situation Investments – Equities.....	332,603
Cash	4,827
	\$ 7,553,596

* The cash and approximate market value of securities held as of December 31, 1968 totalled \$9,928,437.

MORGAN GUARANTY TRUST COMPANY OF NEW YORK,
Trustee

By LOUIS E. IMHOFF,
Assistant Trust Officer

Following is a summary of the Retirement Fund Trust and the Travelers Insurance Company reserves at December 31, 1968:

Retirement Fund Trust – Morgan Guaranty Trust Company of New York, Trustee.....	\$ 7,553,596
Travelers Insurance Company Reserves for Annuities Purchased.....	4,451,549
TOTAL	\$12,005,145

STATISTICS

Year 1968

	<i>Bed Complement(*)</i>	<i>Admissions</i>	<i>Patient Days Care</i>
PRIVATE:			
Presbyterian Hospital (Harkness Pavilion)	210	4,719	75,932
Babies Hospital	3	218	677
Institute of Ophthalmology	19	779	5,797
Neurological Institute	63	1,164	22,312
Sloane Hospital	24	980	5,400
Total Private	<u>319</u>	<u>7,860</u>	<u>110,118</u>
SEMI-PRIVATE:			
Presbyterian Hospital and Sloane Hospital:			
All services (Harkness)	95	3,322	31,708
Gynecology	13	412	4,305
Medicine	9	112	3,179
Obstetrics	29	912	4,632
Orthopedic	55	942	17,100
Otolaryngology	21	1,320	5,649
Surgery	41	719	11,814
Urology	31	681	9,356
Babies Hospital	48	1,604	12,078
Institute of Ophthalmology	50	2,276	16,502
Neurological Institute	85	901	26,087
Total Semi-Private	<u>477</u>	<u>13,201</u>	<u>142,410</u>
WARD:			
Presbyterian Hospital and Sloane Hospital:			
Admitting	14	813	3,327
Dermatology	8	123	2,211
Gynecology	35	914	8,856
Medicine	102	1,904	34,411
Metabolism	10	83	2,234
Obstetrics	83	4,651	24,524
Orthopedic	67	1,234	19,789
Otolaryngology	12	438	2,883
Surgery	90	1,904	28,483
Urology	36	647	10,643
Babies Hospital (including neonatal special care unit of 23 incubators)	147	2,637	37,961
Institute of Ophthalmology	28	974	6,756
Neurological Institute	98	1,180	28,333
Total Ward	<u>730</u>	<u>17,502</u>	<u>210,411</u>
Total	<u>1,526</u>	<u>38,563</u>	<u>462,939</u>
MARY HARKNESS UNIT:			
Total	<u>55</u>	<u>757</u>	<u>12,770</u>
NEWBORNS (Sloane Hospital):			
Private beds	24	623	3,385
Semi-private and Ward beds	90	3,770	19,386
Total	<u>114</u>	<u>4,393</u>	<u>22,771</u>

(*) As of December 31.

OUT-PATIENT DEPARTMENT STATISTICS

	1968	1967
Summary of Patients Treated:		
Number of patients treated.....	<u>63,531</u>	<u>63,471</u>
Number of visits:		
Free	30,088	50,020
Pay	<u>366,878</u>	<u>343,464</u>
Total	<u>396,966</u>	<u>393,484</u>
Average visits per work day.....	<u>1,576</u>	<u>1,561</u>

	New to Clinics	Revisits	Total Visits
Attendance Statistics:			
Dermatology	6,715	17,390	24,105
Emergency and Admitting Wards.....	25,672	19,046	44,718
Group Clinic	5,998	18,196	24,194
Medicine	5,090	35,268	40,358
Neurology	2,436	13,798	16,234
Obstetrics and Gynecology.....	11,532	35,907	47,439
Ophthalmology	3,910	22,600	26,510
Orthopedic	10,285	21,212	31,497
Otolaryngology	5,540	16,037	21,577
Pediatrics	7,512	27,484	34,996
Physical Medicine and Rehabilitation	1,398	14,431	15,829
Psychiatry	1,524	9,434	10,958
Surgery	21,101	26,921	48,022
Urology	1,711	8,818	10,529
Total	<u>110,424</u>	<u>286,542</u>	<u>396,966</u>

PERSONNEL STATISTICS

	On Duty December 31	1968	1967
Administration	12	11	
Assistant Secretary-Treasurer	88	66	
Comptroller	166	147	
Public Interest	20	18	
Mary Harkness Unit	32	34	
Non-professional services:			
Buildings and grounds.....	643	618	
Food service	336	340	
Personnel and protective.....	93	92	
Other non-professional services	167	162	
Professional services:			
Nursing	1,664	1,658	
Professional staff, doctors' offices and research.....	433	418	
Special services	623	585	
Vanderbilt Clinic and other	361	356	
Total	<u>4,638</u>	<u>4,505</u>	
Student Nurses	284	321	
Volunteer Workers	358	530	

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL
 (Including Cribside Social Service Committee)

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1968 and 1967

	1968	1967
Balance, January 1.....	<u>\$21,459.23</u>	<u>\$16,934.67</u>
Receipts:		
Membership dues	900.00	1,080.00
Interest on investments.....	933.00	971.72
Greater New York Fund.....	17,036.00	11,674.00
United Hospital Fund:		
Free Care Distribution.....	9,504.00	11,058.00
Direct Benefit	7,172.00	13,236.00
Special Projects:		
Everybody's Thrift Shop.....	18,478.36	23,085.89
Sewing Class	457.00	345.00
Donations	35.00	12,020.00
Payments by patients for convalescent care, etc.....	878.60	1,063.53
Total Receipts	<u>55,393.96</u>	<u>74,534.14</u>
	<u>76,853.19</u>	<u>91,468.81</u>
Disbursements:		
Used for the care of Ward and Clinic patients.....	7,172.00	13,236.00
Emergency Nursing Fund.....	6,000.00	6,500.00
Staff Development Fund.....	400.00	275.00
Recreational Therapy	4,500.00	4,500.00
Pediatric Psychiatric Clinic.....	1,500.00	1,500.00
Volunteers	500.00	500.00
Salaries	35,061.65	33,932.79
Administration	913.82	1,334.38
Social Service Expenditures for Patients:		
Appliances	773.80	681.89
Clothing	221.81	562.91
Special diets	167.30	219.10
Transportation of patients.....	389.00	515.43
Other	455.79	410.50
Special Projects:		
Sewing Class expenditures.....	25.44	143.97
Thrift Shop expenditures.....	908.42	1,573.69
Summer Camp Expenditures.....	4,200.00	4,076.50
Miscellaneous	269.46	47.42
Total Disbursements	<u>63,458.49</u>	<u>70,009.58</u>
Balance, December 31.....	<u>\$13,394.70</u>	<u>\$21,459.23</u>

PATRICIA MUNN, Treasurer

NEUROLOGICAL INSTITUTE AUXILIARY

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1968 and 1967

	1968	1967
Balance, January 1.....	<u>\$33,957.07</u>	<u>\$22,870.72</u>
Receipts:		
Membership dues	390.00	490.00
Donations	12,690.00	13,085.00
Donations in Memory of Mrs. Sidney J. Weinberg.....		30,430.00
United Hospital Fund:		
Free Care Distribution.....	8,526.00	9,939.00
Direct Benefit	8,378.00	12,612.00
Greater New York Fund.....	15,284.00	10,493.00
Everybody's Thrift Shop.....	23,730.06	13,653.00
Proceeds from Benefit.....	19,753.21	
Payments by patients of advances and loans.....	530.00	779.60
Total Receipts	<u>89,281.27</u>	<u>91,481.60</u>
	<u>123,238.34</u>	<u>114,352.32</u>
Disbursements:		
Social service salaries.....	30,575.03	24,119.80
To Neurological Institute for:		
Endowed Bed in Memory of Mrs. Sidney J. Weinberg.....		10,000.00
Care of Clinic and Ward patients.....	8,378.00	12,612.00
Library	5,237.77	4,756.99
Social Service Staff Department.....	2,050.00	
Social Service Scholarships.....	2,650.00	
Emergency Nursing Fund	3,000.00	2,050.00
Emergency Nursing Endowment Fund	5,000.00	
Volunteer service	1,900.00	1,900.00
Recreational therapist	1,842.63	296.37
Summer Camp Program Endowment Fund.....	5,000.00	
Advances to patients for summer therapeutic care and miscellaneous.....	530.00	779.60
Summer therapeutic care.....	<u>15,840.22</u>	<u>16,467.50</u>
Benefit expenses	7,056.56	2,055.00
Chronic care	8.00	535.00
Medical relief	1,068.15	1,542.15
Staff travel, field and conference.....	214.95	158.40
Everybody's Thrift Shop.....	534.00	1,186.05
Miscellaneous, postage, telephone and publication.....	2,796.39	1,936.39
Total Disbursements	<u>93,681.70</u>	<u>80,395.25</u>
Balance, December 31.....	<u>\$29,556.64</u>	<u>\$33,957.07</u>

ANNE P. KINGSFORD, *Chairman*

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1968 and 1967

	1968	1967
Balance, January 1.....	<u>\$23,147.78</u>	<u>\$25,442.00</u>
Receipts:		
Donations	8,767.76	8,248.72
Investment income for use in Recreational Therapy.....	1,873.82	1,951.60
United Hospital Fund:		
Direct Benefit	8,789.00	15,013.00
Allocation from United Hospital Fund and Greater New York		
Fund Distribution	4,000.00	4,000.00
Total Receipts	<u>23,430.58</u>	<u>29,213.32</u>
	<u>46,578.36</u>	<u>54,655.32</u>
Disbursements:		
Recreational therapist salary	12,044.35	11,008.10
Other recreational therapy expenses.....	468.70	445.66
To Presbyterian Hospital for:		
Care of Ward and Clinic patients.....	8,789.00	15,013.00
Library	2,045.91	1,885.75
Occupational Therapy Aides.....	1,399.04	1,286.70
Volunteer service	1,100.00	1,100.00
Miscellaneous	625.49	768.33
Total Disbursements	<u>26,472.49</u>	<u>31,507.54</u>
Balance, December 31.....	<u>\$20,105.87</u>	<u>\$23,147.78</u>

MARTHA R. WALLACE, *Treasurer*

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1968 and 1967

	1968	1967
Balance, January 1.....	\$ 8,379.99	\$ 7,254.18
Receipts:		
Membership dues	793.00	777.00
United Hospital Fund:		
Free Care Distribution	5,410.00	6,264.00
Direct Benefit	26,977.00	14,115.00
Greater New York Fund.....	9,697.00	6,613.00
Donations	2.50	101.00
Stuyvesant Square Thrift Shop.....	30,516.75	21,425.40
Total Receipts	<u>73,396.25</u>	<u>49,295.40</u>
	<u>81,776.24</u>	<u>56,549.58</u>
Disbursements:		
To Presbyterian Hospital:		
Care of Ward and Clinic patients.....	26,977.00	14,115.00
Monitoring machines	5,580.00	6,000.00
Occupational Therapy	6,031.40	6,200.00
Library	11,529.54	10,978.64
Volunteer service	7,200.00	7,200.00
Recreational Therapy	2,763.97	444.55
Social Service:		
Television sets for patients		1,534.00
Anna Ball Kneeland Memorial Fund for Staff Development in Social Service..	740.00	1,415.00
Miscellaneous	387.32	282.40
Total Disbursements	<u>61,209.23</u>	<u>48,169.59</u>
Balance, December 31.....	<u>\$20,567.01</u>	<u>\$ 8,379.99</u>

JEAN S. LENESS, *Treasurer*ANNA BALL KNEELAND MEMORIAL FUND
FOR STAFF DEVELOPMENT IN SOCIAL SERVICE

For the Years 1968 and 1967

	1968	1967
Balance, January 1.....	\$ 792.33	\$ 170.20
Receipts:		
Women's Auxiliary of The Presbyterian Hospital.....	740.00	1,875.00
Contributions		1.00
Total Receipts	<u>740.00</u>	<u>1,876.00</u>
	<u>1,532.33</u>	<u>2,046.20</u>
Disbursements:		
Seminar and Staff Development Sessions.....	906.00	510.00
Social Service Case Worker Assistant.....	624.00	640.00
Miscellaneous	8.40	103.87
Total Disbursements	<u>1,538.40</u>	<u>1,253.87</u>
Balance, December 31.....	<u>\$(6.07)</u>	<u>\$ 792.33</u>
() Overdraft.		

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

BALANCE SHEET

December 31, 1968 and 1967

ASSETS

	December 31	
	1968	1967
CURRENT FUNDS ASSETS:		
Cash	\$ 98,237	\$ 150,434
Savings accounts	1,490,000	2,300,000
Bank certificates of deposit.....	300,000	
Bonds and stocks — at cost or contributed value (market value — 1968, \$533,451).....	542,859	15,537
Interest and dividends receivable	50,095	38,013
TOTAL CURRENT FUNDS ASSETS	2,481,191	2,503,984
ENDOWMENT FUNDS ASSETS:		
Cash	7,405	1,164
Bonds and stocks — at cost or contributed value (market value — 1968, \$3,786,275)	3,725,676	3,728,431
TOTAL ENDOWMENT FUNDS ASSETS	3,733,081	3,729,595
TOTAL	\$6,214,272	\$6,233,579

FUNDS AND LIABILITIES

CURRENT FUNDS AND LIABILITIES:			
Accrued expenses	\$ 14,328	\$ 3,308	
Special expendable funds.....	2,234,759	2,087,953	
General fund	232,104	412,723	
TOTAL CURRENT FUNDS AND LIABILITIES	2,481,191	2,503,984	
ENDOWMENT FUNDS			
TOTAL	\$6,214,272	\$6,233,579	

NOTES:

The above corporation was established on January 21, 1960 to obtain funds to be used for the joint educational, scientific and charitable purposes now carried on by The Presbyterian Hospital in the City of New York and The Trustees of Columbia University in the City of New York through the Columbia-Presbyterian Medical Center.

The accompanying financial statements do not include amounts contributed directly to Columbia University or The Presbyterian Hospital in the City of New York for the development of the Columbia-Presbyterian Medical Center.

ACCOUNTANTS' OPINION

COLUMBIA-PRESBYTERIAN
MEDICAL CENTER FUND, INC.

We have examined the balance sheet of Columbia-Presbyterian Medical Center Fund, Inc. as of December 31, 1968 and the related summary of fund changes for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered appropriate in the circumstances, as to contributions, it was not practicable for us to extend our examination beyond the Fund's accounting for recorded receipts.

In our opinion, the accompanying balance sheet and summary of fund changes present fairly the financial position of the Fund at December 31, 1968 and, in summarized form, the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

New York
March 4, 1969

HASKINS & SELLS
Certified Public Accountants

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1968 and 1967

GENERAL FUND

	December 31	
	1968	1967
Balance, January 1.....	<u>\$ 412,723</u>	<u>\$ 559,010</u>
Add:		
Unrestricted contributions	89,887	100,042
Investment income (see note).....	<u>14,078</u>	<u>135,047</u>
	103,965	235,089
Deduct — Fund raising expenses for Columbia-Presbyterian Medical Center development program	56,576	36,476
Excess of unrestricted contributions and investment income over expenses.....	<u>47,389</u>	<u>198,613</u>
Total	<u>460,112</u>	<u>757,623</u>
Less Grant and Transfers — Net:		
Grant to Presbyterian Hospital for construction purposes.....	487,057	344,900
Transfers from special expendable funds.....	<u>(259,049)</u>	<u>228,008</u>
	228,008	344,900
Balance, December 31.....	<u>\$ 232,104</u>	<u>\$ 412,723</u>

SPECIAL EXPENDABLE FUNDS

(For Construction, Faculty Salaries and Other Purposes)

Balance, January 1.....	<u>\$2,087,953</u>	<u>\$2,726,447</u>
Add:		
Contributions	694,828	308,766
Investment income (see note).....	<u>284,575</u>	<u>154,895</u>
	979,403	463,661
Total	<u>3,067,356</u>	<u>3,190,108</u>
Deduct:		
Grants to:		
Presbyterian Hospital:		
For construction purposes.....	415,342	943,882
For faculty salaries	22,644	21,695
Columbia University:		
For fellowships	20,809	3,835
For faculty salaries	114,753	132,743
Transfers to general fund.....	<u>259,049</u>	<u>832,597</u>
	832,597	1,102,155
Balance, December 31.....	<u>\$2,234,759</u>	<u>\$2,087,953</u>

ENDOWMENT FUNDS

Balance, January 1.....	<u>\$3,729,595</u>	<u>\$3,186,045</u>
Add:		
Contributions	3,486	543,550

Balance, December 31.....

\$3,733,081\$3,729,595

NOTE:

Commencing January 1, 1968 investment income on construction funds, which in prior years had been credited to the general fund, was credited to the applicable special expendable fund.

COLUMBIA UNIVERSITY-PRESBYTERIAN HOSPITAL
SCHOOL OF NURSING ALUMNAE ASSOCIATION, INC.

STATEMENT OF ASSETS, LIABILITIES AND FUNDS

December 31, 1968 and 1967

ASSETS

	1968	1967
Capital Funds — securities and cash.....	\$1,154,646.17	\$1,104,248.56
Operating Funds — securities and cash.....	19,186.72	24,454.22
Total Assets	<u>\$1,173,832.89</u>	<u>\$1,128,702.78</u>

LIABILITIES

Capital Fund Reserves:		
General fund	\$ 41,215.31	\$ 25,176.29
Benefit fund	244,611.87	235,505.06
Pension fund	740,648.02	719,215.58
Helen Young Memorial fund	6,053.52	6,000.00
Scholarship funds:		
Josephine C. Brown fund.....	1,539.27	1,277.41
Janet B. Christie fund.....	3,453.74	3,175.09
Helen Cunningham fund.....	2,066.25	1,800.44
M. Elizabeth Deans Howell fund.....	2,062.36	1,945.57
Dorothy DeGraff Keim fund	2,372.45	2,202.70
Emma B. Kennedy fund.	44,007.70	42,626.45
Ethel Burnham Kernohan fund	1,552.15	1,389.30
Memorial fund, '20	5,228.64	5,182.22
June Moore fund	1,512.53	1,301.67
Sarah C. Nadel fund.....	908.24	652.29
Richard William Walsh fund	2,732.92	2,708.23
Ruth C. Williams fund	5,480.64	5,333.23
Helen Young fund.....	49,200.56	48,757.03
Total capital fund reserves	<u>1,154,646.17</u>	<u>1,104,248.56</u>
Operating Funds Reserves.....	19,186.72	24,454.22
Total Liabilities	<u>\$1,173,832.89</u>	<u>\$1,128,702.78</u>

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

Cash on Hand, January 1.....	\$ 20,044.76	\$ 22,822.26
Receipts:		
Sale of securities.....	87,628.08	114,390.54
Investment income	60,499.22	57,547.02
Donations	12,971.99	11,663.91
Dues and initiation fees.....	24,606.50	9,674.16
School of Nursing — 75th Anniversary Fund.....	4,081.45	16,689.60
Loans repaid, etc.....	4,392.76	5,241.73
Total Receipts	<u>194,180.00</u>	<u>215,206.96</u>
Disbursements:		
Purchase of securities	87,397.51	114,689.45
Clerical expense and fees.....	10,189.00	13,538.69
Pensions and benefits paid.....	36,950.00	40,170.00
Scholarships granted	4,950.00	7,300.00
Printing, stationery and postage.....	4,907.61	17,805.58
School of Nursing — 75th Anniversary Fund.....	3,387.38	16,203.51
Miscellaneous	10,914.26	8,277.23
Total Disbursements	<u>158,695.76</u>	<u>217,984.46</u>
Cash on Hand, December 31.....	<u>\$ 55,529.00</u>	<u>\$ 20,044.76</u>

MARGARET WELLS, Treasurer

Endowed Beds and Rooms

(1) A gift of \$10,000 shall entitle the donor to nominate a patient to use and occupy one bed in the common wards of the Hospital free of charge (except for special service) for not more than ninety days in any one year.

The donor may at the time of making the gift appoint another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only: —

(a) During the life of the person having the right to nominate, if such right is in an individual.

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

(2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment and discharge of patients.

(3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the objects for which the Hospital was established and is maintained.

(4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

A gift of \$10,000 shall entitle the donor to establish as permanent memorial one memorial endowed bed for research purposes in a ward of the Hospital to be used and occupied by patients free of charge, except for special service.

The President of the Medical Board shall, subject to the approval of the Executive Vice President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes for not more than ninety days in any one year for a period of fifteen years, subject to all rules and regulations governing the admission, treatment and discharge of patients. This privilege shall be assigned to the persons occupying these respective offices (President of the Medical Board and Executive Vice President of the Hospital) at the time the nomination is made.

Endowed Beds and Rooms

Presbyterian Hospital

1868 Mary J. Gelston

1870 Henrietta A. Lenox (2 Beds)
Washington R. Vermilyea
A. R. Wetmore

1871 Estate of John Laurie
Mary Ann Parish

1872 William Earl Dodge
John T. Johnston
Otis D. Swan
Henry Young (2 Beds)

- 1873 James Brown (2 Beds)
John R. Ford
Jonathan Sturges
- 1878 James G. and Henry G. deForest, in memory of Lockwood deForest Woodruff, M.D.
- 1880 William C. Rhinelander
- 1881 Jennet L. and Robert L. Belknap, in memory of Aaron B. Belknap
Fifth Avenue Presbyterian Church
Henry B. Hyde, in memory of his son, Henry B. Hyde, Jr.
John Stewart Kennedy
Frederick and Henry G. Marquand
Edwin D. Morgan (3 Beds)
Mary L. Sheafe
John L. Proudfit
- 1882 Heber R. Bishop (3 Beds)
Mrs. Robert L. Stuart, in memory of her father, Robert McCrea
Edwin D. Morgan
Mrs. Moses Taylor
- 1883 Frederick Billings
Reformed Protestant Dutch Church of the City of New York
- 1884 Rev. Nathaniel W. Conkling, D.D.
West Presbyterian Church, to be known as the "Faith Presbyterian Church Bed"
Madison Square Presbyterian Church, in memory of George W. Lane
- 1885 Brick Presbyterian Church, in memory of Dr. John G. Adams
Richard Irvin
- 1886 Frederic Baker, in memory of Sarah Pyewell Baker
Estate of Dr. Edward Langdon Beadle
Brick Presbyterian Church, in memory of Miss Ann Adams
Fourth Avenue Presbyterian Church Bed by Peter Cumming, in memory of Francis P. Schoals
George E. Dodge
Horace F. Hutchinson, in memory of Ellen B. Schoals
Mr. and Mrs. William D. Sloane, in memory of their son, William D. Sloane, Jr.
Henry S. Wilson, in memory of his son, Harry H. Wilson
- 1887 Fifth Avenue Presbyterian Church
- 1888 Broadway Tabernacle Society
Samuel Inslee, in memory of Kate J. Inslee
- 1889 John Sloane, in memory of his mother, Euphemia Sloane
- 1890 Isaac V. Brokaw, in memory of Ernest B. Brokaw
Sidney Dillon, in memory of Hannah Dillon
Ambrose K. Ely
Josiah M. Fiske
Oliver Burr Jennings

- Mrs. John Stewart Kennedy
 Amelia Kerr
 Fourth Presbyterian Church by Estate of
 Robert Marshall
 Elizabeth D. and Emily M. Wheeler, in memory
 of James Boorman, to be known as
 "The Davenport Bed"
- 1891 Hector C. Havemeyer Bed, by
 Sarah A. Havemeyer, in memory of her son
 Estate of Thomas Hope
 Mrs. A. R. Van Nest, in memory of her husband,
 Abram R. Van Nest
- 1892 John Stewart Kennedy, in memory of his niece,
 Emma Stewart Baker
 Alexander Maitland, in memory of his mother,
 Mary C. Maitland
- 1893 Maria S. Auchincloss, in memory of her husband,
 Edgar S. Auchincloss
 Frances T. Lord, in memory of her husband,
 George deForest Lord
 Presbyterian Church on University Place
 Presbyterian Home for Aged Women
 Margaret A. Sinclair, in memory of her parents,
 Mr. and Mrs. James Sinclair
 West Presbyterian Church
 Young Men's Christian Association
- 1895 Mary Harrison
 Mrs. Clarence M. Hyde, in memory of her mother,
 Rebecca Babbitt
 John Stewart Kennedy, in memory of
 Mrs. Robert L. Stuart
 Mrs. James T. Murray, in memory of her husband,
 James T. Murray
- 1896 Anthony Dey, in memory of Joseph G. and
 Eliza D. Scott
 Jane Hope
 Esther J. Jennings, in memory of her husband,
 Oliver B. Jennings
- 1897 Mrs. Frances E. Baker, in memory of her father,
 James Rich Steers
 William Smith Brown
 Helen Miller Gould, in memory of her parents,
 Mr. and Mrs. Jay Gould
 Margarette E. and Susan D. Griffith, in memory of
 their father, Griffith W. Griffith
 Mary J. Griffith, in memory of her husband,
 Griffith W. Griffith
 Rachael L. Kennedy, in memory of her mother,
 Mrs. Rachael C. Kennedy
 Annie S. Paton, in memory of her husband,
 William Paton
 Charlotte H. Skidmore, to be known as
 "The William L. Skidmore Bed"
- 1898 Brick Presbyterian Church
 Matilda A. Brown, in memory of her son,
 H. Auchincloss Brown
 First Presbyterian Church
 Mrs. Stephen V. Harkness, in memory of her
 daughter, Florence Harkness
 Jane Hope, in memory of her mother,
 Grace Corrie Hope
 John Stewart Kennedy, in memory of
 Rev. William G. Schaufler, D.D., LL.D.
- Mrs. Elliott F. Shepard, in memory of her
 daughter, Florence Vanderbilt Shepard
 Mrs. Elliott F. Shepard, in memory of her
 daughter, Marguerite Vanderbilt Shepard
- 1899 William W. Cole, in memory of his mother,
 Mary A. Cole
 Estate of William Whitewright, in memory of his
 father, William Whitewright, "The Whitewright
 Beds" (10 Beds)
- 1900 Emily B. Hopkins, in memory of her husband,
 Moses Hopkins, "Moses Hopkins Memorial"
 Donald MacKay, in memory of his children,
 Edith Winslow and Walter Wise MacKay
 Caroline L. Macy, in memory of her daughter,
 Mary M. K. Willets
 Estate of Alexander M. Proudfit, to be known as
 the "John McLean Proudfit Bed"
 Laura Roome, in memory of her sons,
 Harry and Alfred Roome
 Martha L. St. John, in memory of her mother,
 Sarah Ward
 Nathaniel Whitman
- 1901 Julia Billings, in memory of her husband,
 Frederick Billings
 Camilla L. Edwards, in memory of her husband
 Walter Edwards
 Andrew J. Garvey, in memory of his mother,
 Elizabeth Jeffries Garvey (2 Beds)
 George Lauder
 Charles H. Marshall
 John E. Parsons, in memory of his children,
 E.L.P., K.M.P., and R.M.P.
 Justine Adele Stafford, in memory of her father,
 Justin A. Bliss
- 1902 Robert Graham Dun
 Margaret J. Plant, in memory of her brother,
 Simon Loughman
- 1903 Heber R. Bishop
 Laura Currier
 Mrs. Francis B. Harrison
 Julia J. MacCartee, in memory of her husband,
 Robert MacCartee
 Madison Avenue Reformed Church
 Adele Berry Sloane, in memory of her father,
 Abraham J. Beery, M.D.
 Justine Adele Stafford, in memory of her mother
 Evelina C. Bliss
 John T. Terry
- 1904 Virginia E. Fowler, in memory of
 Clarence E. Fowler
 Susan Bevier
 Mrs. William Starr Miller
 Josephine Penfold, in memory of
 Dr. Edward Livingston Trudeau, Jr.
 Peter Reid, in memory of his wife,
 Jane Watson Reid
 Francis A. Palmer
- 1905 Frederick G. Bourne
 Mr. and Mrs. Albert H. Gallatin
 Helen C. Inslee, in memory of her husband,
 Samuel Inslee
 Titus B. Meigs, in memory of his son,
 Titus B. Meigs, Jr.

- Mrs. James T. Murray, in memory of
Rev. John Hall, D.D., LL.D.
- Sarah J. Parsons, in memory of her husband,
Charles Parsons
Presbyterian Church on University Place
- 906 Maria L. Campbell, in memory of
Henry Pearsall Campbell
- Susan W. Duncan, in memory of her husband,
John P. Duncan
- Samuel Keyser (3 Beds)
- Sara Pyle McAlpin and James Tolman Pyle,
in memory of their father, William Scott Pyle
The Reformed Protestant Dutch Church in
Garden Street
- John Sloane, in memory of his brother,
Thomas Chalmers Sloane
- John Sloane, in memory of his father,
William Sloane
- 1908 William R. Craig, in memory of his sister,
Florence Faxon Craig
- George B. Goldschmidt, in memory of his mother,
Celestine Goldschmidt
- Samuel Anthony Goldschmidt, in memory of his
mother, Celestine Goldschmidt
- Mrs. Stephen V. Harkness, in memory of her
husband, Stephen V. Harkness
- Charles H. Marshall, Jr.
- 1909 Rev. and Mrs. Robert Russell Booth, in memory
of "Minnie and Willie"
- Canadian Society of New York
- Edward West Currier, in memory of his
stepmother, Laura Currier
- Edward West Currier, in memory of his
stepbrother, Walter B. Currier
- Edward West Currier, in memory of
Edward W. Currier
- Estate of Mary Jane Johnson, in memory of her
husband, William H. Johnson
- J. Theresa Keyser, in memory of her husband,
Samuel Keyser
- Julia Hannon Lyle
- Winfield Tucker, in memory of Joseph, Isabelle
and Adeline (3 Beds)
- J. Spencer Turner, in memory of his first wife,
Cornelia J. Turner
- 1910 Jane A. Townsend, in memory of her son,
Randolph W. Townsend, Jr.
- Jane A. Townsend, in memory of her son,
Harmon W. Norton
- Jane A. Townsend, in memory of her daughter,
Emma L. Norton
- Amelia Mott Graham, in memory of
Malcolm Graham
- Adeline Ives Latham, in memory of her husband,
John Howard Latham
- Estate of Josephine G. Lord, in memory of her
husband, Franklin B. Lord
- 1911 Brearley School Girls and others interested, in
memory of Madam Bertha Beck, the
"Madam Beck Memorial Teacher's Bed"
- Harriet Coles, in memory of her sisters,
Susan and Anna Codman
- Caroline Thorn Kissel, in memory of her husband,
Gustav Edward Kissel
- Katherine Spence Leavitt, in memory of her
husband, Rev. William Leavitt (2 Beds)
- Reformed Low Dutch Church of Harlem
- Frederick Sturges, in memory of his father,
Jonathan Sturges
- William Stewart Tod, in memory of his brother,
George Tod
- 1912 Melville de Wolf, in the Children's Ward,
the "Emma de Wolf Bed"
- Gustavia A. Sciff, in memory of her husband,
Charles A. Senff
- Mrs. Christopher M. Bell, "The Dennistoun Bed"
- Cornelia Eaton, to be known as "The Dr. Reuben
S. Carpenter Memorial" (3 Beds)
- Mrs. Jeremiah V. Meserole, in memory of her son.
Abraham Mescrole
- Josephine Penfold
- Jane G. Phelps, in memory of her husband,
Anson G. Phelps, Jr. (2 Beds)
- 1914 Hugh D. Auchincloss, in memory of his mother,
Elizabeth Auchincloss
- Jane Elizabeth Grannis, in memory of her mother,
"Charlotte Williams Platt Bed"
- William H. Penfold, in memory of
Josephine Penfold
- Louise Tillinghast, in memory of her sister,
Amelia C. Babcock
- Estate of Minnie Hackett Trowbridge (5 Beds)
- 1915 A Friend, in memory of Sophia Kellogg Stebbins
and Mary Tompkins Kimball
- A Friend
- Mrs. Jeremiah V. Meserole, in memory of her
father-in-law, Abraham Mescrole
- Mrs. Jeremiah V. Meserole, in memory of her
husband, Jeremiah Vanderbilt Meserole
- Mrs. Jeremiah V. Meserole, in memory of her
brother, Adolphus Clock
- Mrs. Jeremiah V. Meserole, in memory of her
parents, Alfred and Anna Maria Clock
- 1916 Emil C. Bondy, in memory of
Margaret Carson Cowan
- Central Presbyterian Church
- Mr. and Mrs. James Petrie Chalmers, in memory
of James Petrie Chalmers, Jr., "The Chalmers
Memorial Bed"
- Robert A. Chambers, in memory of his father,
Robert Chambers
- Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
- William D. Sloane (3 Beds)
- 1917 Emeline Y. Danforth, in memory of
Mrs. William B. Jenkins
- Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
- Estate of Sarah C. Miller
- Albert Winter, in memory of
Adaline Benson Winter
- 1918 Ida Leora Olmstead, to be known as the
"Leora McCammon Bed"
- 1919 Samuel Elliott
- Elizabeth Keys, in memory of her daughter,
Edith Keys
- Rutgers Presbyterian Church

- Estate of James R. Steers, in memory of his former wife, Rebecca E. Steers
 Estate of John W. Sterling
- 1920 William C. Boschen, to be known as the "Boschen Bed"
 Rosa Franklin (4 Beds)
 Francis P. Furnald
 Mrs. Francis P. Furnald
 Mary A. Harriot, to be known as the "Margaret Harriot Alms"
 Mary A. Harriot, to be known as the "James Harriot Alms"
 Mrs. Henry O. Havemeyer, in memory of her parents, George William and Matilda Adelaide Elder
 Estate of Margaret J. Orr, in memory of her mother, Ann Boyd Orr
 Anna St. John, in memory of her brother, Milton St. John
- 1921 Mrs. Peter B. Wyckoff, to be known as the "Sidney Dillon Bed"
 Henry M. Gescheidt
 Ralph E. Prime, in memory of his daughter, Ruth Havens Prime
 Joseph K. Gwynn
 Charles S. Ward, in memory of his friend, Sophie L. Kinman
 Charles S. Ward
- 1922 Minetta C. Howenstine (8 Beds)
 Christina C. Munro, in memory of her husband, John Munro
 Anna M. Romaine, in memory of Dr. William I. Detmold
 Estate of Arnold Thayer (2 Beds)
 Hamilton B. Tompkins, in memory of his wife and himself
- 1923 Lydia Augusta Brown
 Josephine Newman Hall
- 1924 Bohemian Society "Lidumil"
 Cordelia F. Turrell
 Nannie Gyles Johnson, (Children's Ward), in memory of her son, Shirley Everton Johnson
 Mrs. William John Fitzgerald
- 1925 Christina Bond, in memory of Julia C. Skidmore
 George Clarke
 Estate of Elizabeth J. Hofer, in memory of Catherine Parke and Horatio C. Kretschmar (2 Beds)
 Edward M. Morgan Memorial Association, in memory of Edward M. Morgan (4 Beds)
 Jeanette Robertson, to be known as the "Helen C. Inslee Endowed Bed"
- 1926 Elizabeth Ellen Auchincloss, to be known as the "E. E. Auchincloss, Jr. Bed"
 Members of the New York Stock Exchange, to be known as the "Seymour LeGrande Cromwell Memorial" (2 Beds)
 Edmund Penfold, in memory of Josephine Penfold and William Hall Penfold (2 Beds)
 Dr. and Mrs. M. Allen Starr, in memory of Allen Egbert Starr
- John B. Trevor, in memory of Emily N. Trevor
 West End Collegiate Church
 George D. Widener
- 1927 The Second Presbyterian Church in the City of New York
 Ellen Mills Borne, in the Children's Ward, to be known as the "John E. Borne Bed" and the "Nellie M. Borne Bed" (2 Beds)
 Virginia Marquand Monroe, in the name of the Young Men's Christian Association
 Mrs. Charles H. Senff, to be known as the "Dr. George A. Tuttle Bed"
 W. Frazer Gibson, in memory of his mother, Jeanette Frazer Gibson, to be known as the "Jeanette Frazer Gibson Bed"
 Augustus C. Gurnee, in memory of his mother, Mary M. Gurnee (2 Beds)
 Eliza V. Nicholson
 Mrs. Murray W. Dodge and Mrs. Franklin Lord in memory of their mother, Mrs. Fordyce D. Barker (Single Ward Room)
 Dunlevy Milbank (Single Ward Room)
 F. Ethel Wickham, in memory of her father, William Hull Wickham, to be known as the "William Hull Wickham Bed" (Single Ward Room)
 Anna A. Johnston, in memory of her parents, William G. and Adriana C. Gardner
 Anna A. Johnston, in memory of Lewis, Anna, Edward and Mary Johnston (Single Ward Room)
 Broadway Presbyterian Church, to be known as the "Walter Duncan Buchanan Bed"
- 1928 North Presbyterian Church
 In memory of McKevers Bayard Brown (Single Ward Room)
 Caroline B. Sellew (4 Beds)
 The Red Cross Rooms for Nurses (3 Single Ward Rooms)
 Robert W. deForest (Single Ward Room)
 Henry W. deForest (Single Ward Room)
 James R. Steers
 Jane Livingston Armour, in memory of John A. Livingston
 Jane Livingston Armour, in memory of Herman O. Armour
 In memory of Meredith Howland Pyne
 Stella C. and Roi C. Megrue (Single Ward Room)
 Mrs. E. C. Wills, in memory of her mother, Mrs. J. F. Ackerman, and her sister, Mrs. W. Clarence Reed
- 1929 Caroline White, in memory of her sister, Eliza W. White
 Elizabeth A. Hays, in memory of William and Charlotta Hays
- 1930 Mr. and Mrs. Ernest Trow Carter
 The Presbyterian Church in the Town of Rye, New York
 Mrs. Arthur E. Lauderback, in memory of her mother and father, Esther Hull Jackson and Peter A. H. Jackson
 Mary L. Walker Peters, to be known as "The Charles Grenville Peters and Mary Walker Peters Frcc Bed"

- Marie F. Coddington, to be known as
"The Emilie Coddington Bed"
- 1931 Mrs. Clara Beales Obrig, in memory of
Adolph Obrig and Clara Beales Obrig
(Single Ward Room)
- Alfred V. Meserole, in memory of his mother,
Evelina A. Meserole
- 1932 In loving memory of Justine Adele Stafford
(Mrs. W. F. Stafford) by her sister,
Ida Evelina Bliss
- 1933 Mrs. John A. Hance and Mrs. Irene Louise Hance,
in memory of James R. Jesup
- 1934 Ida Adams, in memory of her sister, Sadie E. and
her brother, Robert F. Adams (Single Ward
Room)
- Josephine Leypoldt, in memory of her brothers,
Louis and Frederick Leypoldt (2 Beds)
- 1935 Walter J. M. Donovan, in memory of his father,
Timothy Donovan
- 1936 Elizabeth P. Hewes, to be known as
"The Elizabeth P. Hewes Bed"
- Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
- Mary S. Thayer, to be known as
"The Orlando Thayer Bed"
- 1937 Margaretta J. Gamble, to be known as
"The Gamble Bed," in memory of her
father and mother
- Jeremiah Milbank, in memory of his father,
Joseph Milbank
- 1938 Susetta L. Goss, to be known as "The Goss Bed,"
in memory of her parents, Rev. C. C. Goss and
Theodosia C. Goss
- Annie Miller, to be known as "The Mrs. Alexander
Miller Memorial Bed," in memory of her
mother, Mrs. Alexander Miller
- Bertha H. Minturn, in memory of her most
faithful and beloved nurse, Mary Humphries
- Henry T. Sloane, to be known as "The Euphemia
Sloane Coffin Bed," in memory of his sister,
Euphemia Sloane Coffin
- 1939 "In Memoriam"
- Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
- 1940 George Gibbs, to be known as "The George
Gibbs Bed"
- 1942 Mrs. Huntington McLane, to be known as the
"Therese K. Thorne Bed," in memory of her
mother
- Cornelia Livingston Pell, in memory of
Alfred Duane Pell
- Frank Wallach, in memory of Ida May Wallach
- 1943 Stuart Duncan, to be known as
"The Stuart Duncan Bed"
- 1944 Anonymous, to be known as "The Dr. William
Darrach Bed"
- John Fraser, in memory of his parents,
Alexander and Elizabeth Fraser
- 1945 Robert W. Carle, in memory of his mother,
to be known as the "Cornelia Willets Carle Bed"
for general hospital use including harelip and
cleft palate cases
- 1947 W. and J. Sloane
- Frederick Sturges, Jr., Mrs. Mary Armit Sturges,
Mrs. Catharine Armit Chapman and Frederick
Sturges, III, in memory of Frederick Sturges
- Walter S. Gifford, in memory of his son,
Walter Sherman Gifford, Jr.
- Ida L. Darling, to be known as the
"Richards Memorial Bed"
- John Sloane, in memory of his wife, Elsie Nicoll
Sloane, to be known as the "Elsie Nicoll
Sloane Bed"
- Elisa Smith Mabon, in memory of her husband,
James Brown Mabon
- 1948 Otto M. Eidritz, to be known as the "Eidlitz Bed"
- 1949 Effie B. Shearman
- 1951 Gerrish Hill Milliken
- 1952 William Dzus, to be known as the "Ukrainian
Institute of America, Inc. Bed"
- 1953 Estate of Charlotte C. Garretson, to be known as
the "Charlotte Higbee Kelsey Bed"
- W. Alton Jones Foundation, Inc., to be known as
the "Nettie Marie Jones Bed"
- 1954 Estate of M. Samuel Stern, to be known as the
"M. Samuel Stern Memorial"
- 1955 Estate of Robert J. Eidritz, to be known as the
"Marc Eidritz Bed"
- Mrs. John S. Holbrook, in memory of her parents,
John Johnston and Mary Sloane Sinclair
- 1956 Estate of Aurie Dell Black, to be known as the
"Aurie Dell Black Bed"
- Robert W. Carle, to be known as the
"Adele Skiddy Carle Bed"
- Estate of Adolph Riesenber, to be known as
"The Adolph and Anna A. Riesenber Bed"
- 1957 George F. Cahill, M.D., to be known as the
"Endowed Bed for Personnel of the Squier
Urological Clinic"
- Edward H. Carle, in memory of his father, to be
known as the "John J. Carle Bed"
- Mrs. William J. Demorest, in memory of her
parents, Wealthy H. Lewis and
Richard James Lewis
- Chancellor Kent Lodge 870, Free and Accepted
Masons, in memory of George J. Weissman
- Morris Morgenstern Foundation, to be known as
the "Sadie B. Morgenstern Bed"
- Estate of Mary Ross Potter, to be known as the
"Georgianna Morley Bed"
- Estate of Mathilde S. Sterne, to be known as the
"Simon Sterne Beds" (4 Beds)
- Board of Trustees of The Presbyterian Hospital,
in honor of and to be known as the "Charles P.
Cooper Endowed Bed"
- 1958 Mrs. Robert W. Carle, to be known as the
"Robert W. Carle Bed"
- 1959 William Dzus, to be known as the "Ukrainian
Institute of America, Inc. Bed"
- Mrs. Stanley G. Mortimer, to be known as the
"Stanley G. Mortimer Bed," in memory of her
husband
- Mrs. John S. Thacher, to be known as the "Frances
E. Baker Bed," in memory of her mother

- 1960 Estate of Exerene L. Flood, to be known as the "Dr. George Ballery Flood Endowed Bed"
Minister, Elders and Deacons of The Collegiate Reformed Protestant Dutch Church of The City of New York, to be known as "The May A. Ingenthron Memorial Bed"
- Estate of James Miller, to be known as the "A. Miller Endowed Bed"
- Estate of Joan D. Sanger, to be known as the "Bertram J. Sanger Endowed Beds" (2 Beds)
- 1961 Estate of Ellen Clarke Bertrand, to be known as the "Ellen Clarke Bertrand Memorial Endowed Bed"
Mr. and Mrs. Samuel W. Meek, in memory of Michael Jeremy Meek
- 1962 Mrs. William J. Demorest, to be known as the "Howard W. Albro Memorial Endowed Bed"
Estate of Henrietta S. Wolf, to be known as the "Julia Wolf Endowed Bed"
- 1963 George S. Walden, in loving memory of Mrs. Julia E. Carroll
- 1965 Estate of Mildred E. Sterry, in memory of her mother, Katherine Landers; her brother John J. Landers and herself (4 Beds)
- 1966 Estate of Agnes Irvine, in the name and memory of Daniel Elmer Salmon (6 Beds)
Estate of Florence R. Paul, in memory of her mother, Kathryn Wilson Roberge (5 Beds)
Estate of Florence R. Paul, in memory of her brother, Franklin Pierce Roberge
- 1967 Estate of Clarence J. Schmelzel, to be known as the James Henry Schmelzel and Annie Louise Schmelzel Endowed Beds. (12 Beds)
- 1968 Estate of Catherine Ridley, in memory of her mother, Catherine Ridley, and her father, Arthur J. Ridley (5 Beds)

Memorial Endowed Beds for Research Purposes

- 1948 Mrs. William Barclay Parsons, in memory of her husband, General William Barclay Parsons
Muriel Jane Rudinger Foundation, Inc., to be known as the "Muriel Jane Rudinger Bed"
- 1950 Charles E. Culpeper Foundation, Inc. (2 Beds)
- 1952 John F. Bush Memorial Bed
Estate of Selma Boyd, each to be known as a "Boyd Bed" (2 Beds)
Bruce Barton, in memory of his wife, to be known as the "Esther Randall Barton Memorial Bed"
- 1953 Herman Goldman Foundation, Inc., in memory of Theresa and Frank Goldman
W. Alton Jones Foundation, Inc., in memory of Mamie W. Marvin
- 1954 Mr. and Mrs. Charles P. Cooper, in memory of Mrs. Cooper's father, Dr. Charles Lathrop Parsons
"John Shepard Parke Mcmorial Bed"
Mr. and Mrs. Sidney J. Weinberg, in memory of their parents

- 1955 Bruce Barton, in memory of Clyde Scott and Helen Barton Stilwell, to be known as the "Clyde Scott and Helen Barton Stilwell Memorial Bed"
George F. Cahill, M.D., Research Bed in the Department of Urology
Mr. and Mrs. Charles P. Cooper, in memory of Mrs. Cooper's mother, Mrs. Charles Lathrop Parsons
Herman Goldman Foundation, Inc., in memory of Theresa and Frank Goldman
Williams-Adler Foundation Bed
- 1959 "John Shepard Parke Memorial Bed"

Endowed Rooms

- 1903 Henry H. Rogers, to be known as "Room J"
- 1905 Mrs. Morris K. Jesup, to be known as the "Eliza de Witt Memorial Room"
- 1910 Mrs. John Stewart Kennedy, in memory of her husband, to be known as the "J. S. K. Memorial Room"
- 1912 Peter Cumming, to be known as "The Peter Cumming Memorial Room"
- 1926 Alumnae Association of the School of Nursing of The Presbyterian Hospital, to be known as the "Amabel S. Roberts Memorial Room"
- 1928 Mrs. William Sloane, to be known as "The William Sloane Room for Graduate Nurses"
- 1930 The Sarah A. Hard Taylor Memorial Fund, to be known as "The Sarah A. Hard Taylor Room"
- 1935 Mrs. Herbert Neal, in memory of her first husband, James Norman Hill
- 1937 S. Augusta Mora, in memory of her husband, Frank Mora and mother, Sarah Robson Van de Water
- 1946 Estate of Caroline Catherine Cary, to be known as the "Caroline Catherine Cary Endowed Room"
- 1960 Mr. and Mrs. Robert W. Carle, to be known as "The Robert W. and Adele S. Carle Endowed Room"
Estate of Bertha C. Miller, to be known as the "James Miller Endowed Room"
- 1961 Estate of Sarah Louise Johnston, to be known as the "Andrew Johnston Memorial Room"
- 1962 The Dr. Thomas W. Stevenson Memorial Fund, a semi-private room to be known as "The Dr. Thomas W. Stevenson Memorial Endowed Room"
- 1963 Estate of Adele S. Carle, to be known as the "Robert W. Carle Roonis" (7 Rooms)
- 1964 Mr. John S. Thacher, in memory of his mother, Frances Lake Thacher
- 1965 Estate of Jennie Hankinson Sinclair, two rooms to be known as "The Francis MacDonald Sinclair Endowed Room," and "The Jennie Hankinson Sinclair Endowed Room"
- Babies Hospital**
- 1892 The Cribside Committee, to be known as "Cradyl-Nyst"

- 894 Miss Ellen James Evans
Henry Stewart Trevor, by Mrs. Henry G. Trevor
- 895 Mrs. Evan T. Walker
Mrs. Richard Arnold, in memory of
Georgiana Arnold
- 896 Mr. and Mrs. Charles M. Fry, to be known as the
"Mr. and Mrs. Charles M. Fry Bed"
- 897 Mrs. George Kemp, for the use and purposes of
the Hospital
- 898 Mrs. Oliver G. Jennings, to be known as the
"Brewster Bed"
- 899 Mr. and Mrs. John Sherman Hoyt, in memory of
John Sherman Hoyt, Jr.
- 1900 Mrs. Elizabeth Chamberlin Lockwood, in memory of
Emily Beaver Chamberlin
- 1902 Mr. and Mrs. William E. Dodge, in memory of
their granddaughter, Grace Osborn
Henry P. Wertheim, in memory of
Clara W. Wertheim
- 1904 Mr. and Mrs. George Arents, in memory of
George Arents Brown
Estate of Mrs. Charles Harvey Hartman
- 1905 Mrs. J. Henry Lane
Mrs. Daniel S. Lamont, to be known as the
"Julia Lamont Bed"
- 1907 The Cribside Committee
- 1908 Arthur W. Butler, in memory of
Elizabeth Marshall Butler
- 1910 Dr. and Mrs. L. Emmett Holt, in memory of
Kenneth M. Holt
Edwin Clarence Moller, in memory of his father,
Peter Moller
- 1911 Emily A. Watson, in memory of Wheeler Watson
Mrs. Bradley Martin, in memory of
David Bradley Martin
- 1912 In loving memory of J. Bradley Cumings, endowed
by his friends. "Greater love hath no man than
this, that a man lay down his life for his friends."
— St. John 15:13
- 1914 Mrs. Andrew Carnegie, in memory of
Archibald Fraser Barrow
Estate of Mrs. Robert W. Todd, to be known as
"The Mabel Todd Bed"
- 1916 Mr. and Mrs. John Chandler Moore, in memory
of Edward de Bébian Moore, the
"Edward de Bébian Moore Bed"
Mrs. John Hubbard, in memory of
Margaret Fahnestock
Mrs. Clarence M. Hyde, to be known as the
"Clara Mathewson Hyde Bed"
- 1917 Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
Mrs. Edward S. Harkness, to be known as the
"Thomas Stillman Taylor Bed"
Mr. and Mrs. Walter A. Hirsch, in memory of
John Walter Hirsch
- 1919 Mr. and Mrs. Daniel Schnakenberg, in memory of
their daughter, Anna Kate Bartlett
Mrs. John Jay Knox, in memory of John Jay Knox
Mrs. John Jay Knox, in memory of
Dr. Reuel B. Kimball
- 1920 Mrs. Andrew Carnegie, a thanks offering for
Louise Carnegie Miller
- 1921 Estate of Jacob H. Schiff
- 1922 The Cribside Committee, in memory of
Sarah Elizabeth Williams
Mr. and Mrs. Simon Guggenheim, in memory of
their son, John S. Guggenheim
- 1923 Mr. and Mrs. Herman Armour Nichols, in loving
memory of Marie Louise Nichols
- 1929 Estate of Julia M. Stout
- 1930 Estate of Edith Crosby Thomson, in memory of
her mother, Mrs. Grace H. Thompson
- 1934 West End Collegiate Church
- 1935 Estate of Daniel Schnakenberg, in memory of his
children, Daniel Schnakenberg, Jr. and
Marie Schnakenberg
- 1936 Estate of Carrie Guggenheim
- 1938 Estate of Emily S. Hornblower, in memory of her
stepdaughter, Susie Sanford Hornblower, the
"Susie Sanford Hornblower Bed"
- 1949 Dr. Frederic H. Bartlett. Endowed in loving mem-
ory of Frederic H. Bartlett, M.D., 1872-1948, by
his patients and other friends, to commemorate
his many years of faithful service in Babies
Hospital
- 1950 Estate of Emelyn L. Coolidge, in memory of
Marianna Wheeler and Emelyn L. Coolidge,
M.D., to be known as "The Wheeler-Coolidge
Bed"
Estate of Isabel Shields Kemp, to be known as the
"Mary M. Shields and the Dr. Robert Coleman
Kemp Free Bed"
- 1957 Estate of Martha S. Reynolds, in memory of her
mother, Ernestine Schaffner
- 1962 Estate of Caroline D. Hewitt, to be known as the
"Caroline Danella Hewitt Endowed Bed"
- 1964 Mr. and Mrs. Samuel Rogovin, in honor of their
parents, Mr. and Mrs. Louis Rogovin and
Mr. and Mrs. Bernard R. Simon
- Neurological Institute**
- 1929 The Red Cross Endowed Room for Nurses
Rivington-Dwyer Endowed Room for Nurses
- 1943 Alice Dunning Starr, in memory of her husband,
Allen Starr
- 1959 Jack J. Dreyfus, Jr., in honor of his father, the
"Jack J. Dreyfus, Sr. Bed"
- 1967 "In Memory of Mrs. Sidney J. Weinberg, donated
by her husband and Family."
"In Memory of Helen Livingston Weinberg (Mrs.
Sidney J. Weinberg) from funds donated by her
friends and those of the Family."

Memorial Endowed Beds for Research Purposes

1952 Estate of John H. Bahrenburg, in memory of John H. Bahrenburg and Elizabeth Bahrenburg (16 Beds)

New York Orthopaedic Hospital

1883 Miss C. B. Hicks, continued in perpetuity by Buchanan Winthrop

1886 Mrs. Elizabeth Milbank Anderson, in memory of J. Milbank Anderson (4 Beds)

1891 Alfred Corning Clark (3 Beds)

Edward Severin Clark, to be known as the "Edward Severin Clark Beds" (2 Beds)

Mrs. Henry S. Winthrop

1893 Mrs. William D. Sloane, in memory of William Douglas Sloane, Jr.

James K. Gracie, in memory of Anna Bulloch Gracie

Miss Sarah B. Gibbs

1894 Mrs. Richard Tylden Auchmuty, in memory of Richard Tylden Auchmuty (2 Beds)

James H. Jones

1896 Mrs. William Astor, in memory of Helen Roosevelt

Mrs. Evan T. Walker, in memory of John J. Walker

1897 Mrs. William D. Sloane, one bed in memory of Maria Louise Vanderbilt and one in memory of Emilie Vanderbilt Burden

1898 Mrs. Charles B. Alexander, for her daughter, named the "Harriet Alexander Bed"

1901 Mrs. N. A. Baldwin, in memory of Louise Suydam Duer

Mrs. Benjamin Brewster, in memory of Benjamin Brewster

Jessie and Emily Sloane Bed, endowed by their father, Henry T. Sloane

Mrs. Marion Story, in memory of M. Furman Hunt

1902 James Henry Smith, in memory of George Smith (2 Beds)

Miss Emily A. Watson, in memory of Mrs. Mary J. Walker

1904 Miss Cornelia Prime, in memory of her brother, Temple L. Prime

Miss Helen Phipps

James K. Gracie, in memory of Esther Gracie Ogdens

1906 Miss Caroline White

Mrs. M. Dwight Collier, in memory of Maurice Dwight Collier

1908 Mrs. H. N. Munn, Mrs. Augusta Munn Tilney and Orson D. Munn, in memory of Henry Norcross Munn

1911 Estate of Everetta C. Whitney
Miss Josephine C. Smith, in memory of her father, Dr. Edward A. Smith, and her mother, Rebecca Miller Smith

1913 Estate of Marion de Forest Clark, in memory of Julian Bouton Clark

An anonymous donor, to be known as the "Mary Townsend Cuyler Bed"

Carolina F. Butterfield, in memory of Frederick Falconer Butterfield

1915 Miss Emily Trevor

Mrs. Frederick W. Vanderbilt, to be known as "The Louise Bed"

George Grant Mason, in memory of his uncle, James Henry Smith (2 Beds)

1916 Henry M. Tilford, in memory of Catharine Hunt Tilford

Estate of Clementine Furniss, to be known as the "Clementine Furniss Bed"

An anonymous donor

1917 Mrs. Charles H. Senff, in memory of her little son, Henry Senff

Mrs. A. Murray Young, in memory of her great uncle, Wilson G. Hunt

1919 R. Fulton Cutting, to be known as the "Helen Suydam Cutting Bed"

Mrs. Frederick Delano Hitch

Levi P. Morton, in memory of Anna Livingston Morton

Miss Georgiana G. R. Wendel, in memory of her sister, Augusta A. S. Wendel (2 Beds)

Various donors, in memory of Theodore Roosevelt

1920 Mrs. John Hobart Warren

1921 Mrs. Winthrop W. Aldrich, in memory of her little son, Winthrop Williams Aldrich, Jr.

F. Ambrose Clark, to be known as "The Florence L. Clark Bed"

1922 Mrs. David T. Dana, in memory of her mother, Mrs. M. Dwight Collier

1924 Estate of Charlotte Bruce Bickmore, in memory of Albert Smith Bickmore, Jr.

Estate of Louise Ward McAllister Lewis, in memory of her mother, Sarah T. McAllister, to be known as "The Sarah T. McAllister Bed"

1925 Estate of Elizabeth J. Hofer, in memory of Horatio C. Kretschmar (2 Beds)

Percy Chubb, in memory of his wife

Junior Red Cross of the Public Schools of the City of New York

Mrs. Douglas Robinson, in memory of her friend, Charles Allen Munn

1926 Junior Red Cross of the Public Schools of the City of New York

1927 Darrach Home for Crippled Children, in memory of Dr. May Darrach

- 1928 Mrs. Mary L. Schoonmaker, in memory of Sylvanus Lothrop Schoonmaker and Frank Layng Schoonmaker (10 Beds)
 Estate of Henry D. Dickinson, in memory of Hathaway M. Dickinson
- 1930 James T. and Sarah Bancroft Leavitt, to be known as the "Mrs. James T. Leavitt Bed"
- 1934 Henry C. deRham, Frederic F. deRham and Clarisse deRham Rutherford, in memory of their parents, Charles and Emily Howe deRham
- 1935 Mrs. Percy R. Pyne and family, in memory of Meredith Howland Pyne
- 1936 Miss Elizabeth Stewart Hamilton, in memory of Mrs. John Hobart Warren, to be known as the "Harriette Mott Warren Bed"
 Mrs. Edward S. Harkness, to be known as the "Dorcas House Bed" in dear memory of Wilma Gideon
- 1938 Miss Grace Howard Potter, to be known as the "Howard and Mary Louisa Potter Bed," in memory of her father and mother
- 1955 General and Mrs. E. F. Maude, in memory of Mrs. Maude's father, Robert S. Brewster
 Estate of Carrie Rosenshine, to be known as "The Lillie Rosenshine-Marjorie L. Kaufman Bed"
- 1956 Estate of Adolph Riesenber, to be known as "The Adolph and Anna A. Riesenber Bed"
- 1967 Estate of Elliot W. Lawrance, in memory of Clifford Lawrance King.
- 1967 Estate of Elliot W. Lawrance, in memory of Mrs. Thelma Mary Lawrance.

Endowed Rooms

- 1922 Glenn Ford McKinney, a ward room in the country branch, in memory of his wife, Jean Webster McKinney

1929 400 of his friends and associates, a room in the private pavilion, in memory of H. Le Roy von Lackum, M.D., surgeon in this hospital, 1916-1928

- 1967 Mrs. Anna I. Feldman, a semi-private room, in memory of her husband, to be known as the Anna I. Feldman Room, in loving memory of her husband, Irving J. Feldman.

Institute of Ophthalmology

(Including Herman Knapp Memorial Eye Hospital)

- 1883 Mrs. Oswald Ottendorfer
- 1884 Miss Henrietta A. Lenox
- 1895 Miss Mary Morris van den Heuval
- 1897 Mrs. Giovanni Ceccarini
- 1913 Miss Catherine A. Bliss
 Miss D. Willis James
- 1918 Truman Peck Stone
- 1921 Miss Rosie Bernheimer, in memory of her parents
- 1923 Miss Mary Wiley, in memory of her brother, George Wiley
- 1928 Mrs. Matilda Townsend Palmer
- 1931 Lee Doblin
- 1936 Charles M. Brooks
- 1957 The Mortimer and Harriet M. Marcus Foundation, Inc., to be known as "The Mortimer and Harriet M. Marcus Endowed Bed"
- 1964 Estate of Thomas W. Byrnes, in memory of his wife, Minnie Marcey Jarboe Byrnes

Endowed Bed for Research Purposes

- 1965 Malcolm P. Aldrich, to be known as the "Malcolm P. Aldrich Endowed Research Bed"

Index to Professional and Academic Staffs

PAGE	PAGE	PAGE			
Abel, Marshall	226	Andreae, Eric	242	Banyard, Richard	227
Abell, Liese L.	239, 240	Andree, Ronald	239	Barach, Alvan L.	222
Abrahams, Irving	223, 240	Andrews, David L.	227, 234, 245	Baratz, Robert A.	222, 239
Abrams, Cyril A. L.	228, 246	Andrews, George C.	222	Barbee, William R.	223
Abramson, Harry	228	Angelides, Alexander C.	227	Bard, Richard H.	232
Abrass, Itamar B.	224	Ansanelli, Jr., Vincent P.	254	Barden, Herbert	246
Ackley, Jr., Alexander	224	Antenucci, Arthur J.	241	Barker, Harold G.	231, 253
Ackerman, Nathan	229, 250	Antillon, Jose R.	229	Barker, Leslie P.	222, 240
Adams, George H.	249	Appell, Kenneth C.	254	Barnaby, Jr., Henry	259
Adams, Mary	228	Applebaum, Edmund	238	Barnum, Howard J.	224, 241
Adamsons, Jr., Karlis	226, 243	Appleby, Robert E.	228, 247	Barone, Mary R.	243
Adcock, III, Eugene W.	229	Aranow, Jr., Henry	211, 223, 240	Barrer, Harry G.	258
Adelson, Jerry J.	259	Archbold, Patricia G.	243	Barrett, C. Redington	242
Adler, Theodore	258	Arden, Howard A.	236, 259	Barrett, Robert E.	225, 243
Adlersberg-Zolman, Mella	239	Arkoulakis, Stamatis E.	232, 253	Barry, J. Wright	224, 240
Adsit, Charles G.	242	Arm, Stuart B.	226	Barry, Terrence J.	227
Agarwal, Staish C.	242	Armstrong, Richard M.	226	Bartelstone, Herbert J.	247
Agate, Frederic J.	238	Arnold, William J.	247	Bartman, Jacqueline R.	228
Akasaka, Keijiro	227	Asch, Morris J.	231	Bartsich, Ernst G.	226
Akiyama, Toyooiro	243	Asch, Thane	230, 252	Bartwink, Jerome	259
Albert, Harry D.	230	Ashley, Charles A.	234, 246	Baruch, Jack	230
Albert, Morris S.	228	Ast, David B.	249	Basek, Milos	227, 234, 245
Albrecht, Robert M.	248	Atchley, Dana W.	210, 222, 238	Bassett, Arthur L.	247
Albright, Nile L.	232	Athos, William J.	242	Bassett, C. Andrew L.	227, 234, 245
Aldin, Peter	251	Atkin, M. David	228, 247	Bauer, Herman E.	249
Alexander, George	239, 250	Attia, Albert	241	Bauman, Eli	224, 241
Alexander, Jack T.	247	Atwood, William G.	223, 240	Bauman, William A.	228, 246
Alexander, Stewart F.	224, 240	Auburn, Robert	226	Baumgarten, Jr., Harold	248
Alfaro, Maurice J.	227	Auchincloss, Jr., Hugh	231, 253	Baumstark, Reynold J.	258
Algus, Seymour	259	Auerbach, Richard C.	231	Baurmash, Harold D.	258
Allard, Gilles G.	246	August, Burton	229, 250	Baxt, William G.	225
Allderdice, Penelope W.	244	Ayers, Herbert D.	236, 259	Beach, Jr., Paul M.	231, 253
Allen, Lucretia	246	Azar, Henry A.	227, 245	Beaty, John T.	224, 241
Allen, Jr., Thomas E.	230	Azar, Isaac	222	Beck, Gustav J.	224, 241
Alling, Frederic A.	252	Azzoni, Alfred A.	231	Beck, Leah	229, 250
Almendorf, Irving A.	246	Bachman, Arnold L.	253	Becker, Alfred	224
Alpert, Elmer	240	Bacon, Darline A. T.	243	Becker, Jr., George L.	242
Alpert, Meyer	252	Badder, Elliott M.	232	Becker, Joshua A.	230, 252
Alpert, Morris S.	246	Baden, Ernest	246	Beckerman, Todd	259
Alsop, Reese F.	241	Badgley, Robin F.	249	Beckmann, Albert J.	228, 248
Alston, Casco	224, 240	Baehr, George	249	Bedford, John M.	238, 255
Altman, Harry S.	228	Baer, Leslie	225	Bednarz, Brian N.	231, 253
Altshuler, Kenneth Z.	250	Baerg, Richard D.	225	Been, Harold	230
Amaro, Mario	222	Bailey, Frederick R.	235	Begg, Charles F.	246
Amato, Nadia M.	222	Bailey, Margaret B.	249	Behrens, Myles M.	227
Amberson, J. Burns	222, 238	Bakamjian, Veronica	239	Beiser, Sam M.	234, 242
Ambrose, George B.	227, 245	Baker, Alice T.	224, 241	Belair, Carmela V.	243
Amendola, Frederic H.	254	Baker, Jr., Daniel C.	210, 211, 227, 234, 235, 245	Belanger, Raphael	241
Amerasingham, Candra Raj	241, 246	Baker, David H.	230, 252	Beldoch, Michael	251
Ames, Martin	258	Baker, Katherine J.	240	Bell, A. Loomis	241
Ames, Richard A.	223	Baldwin, Jr., John M.	233, 240	Bell, Donald C.	229, 251
Ames, Richard P.	224, 241	Balfe, John W.	229	Bell, Jennifer J.	228, 246
Ames, Rose G.	228, 246	Balfour, Jr., Henry H.	229	Beller, Alexander	251
Amols, William	225, 242	Baliga, Bantval S.	239	Bellin, Howard T.	232, 253
Amos, Franklyn B.	249	Ballantyne, Lowyd	254	Beltrani, Vincent S.	223
Anderson, Albert D.	231, 252	Ballard, Andre B.	229, 250	Bemporad, Jules	230
Anderson, Jr., Carleton T.	228	Ballard, Bruce L.	230	Benamy, Daniel A.	243
Anderson, Jr., Charles R.	225	Ballard, Harold S.	241	Bender, Michael D.	225
Anderson, Ethel I.	244	Balser, Benjamin H.	229, 252	Benesch, Reinhold	239
Anderson, Helen, M.	223, 240	Bank, Arthur	223, 240	Benesch, Ruth E.	239
Anderson, Julien W.	258			Benfield, James W.	259
				Benjamin, William B.	224, 240

PAGE		PAGE	
Benkel, Bernard	259	Blumenthal, Richard L.	251
Bennahum, David	230	Blumenthal, Sidney	228, 234, 246
Bennett, Courtenay L.	249, 251	Boelster, Roy	259
Bennett, Ruth	251	Bollinger, Charles	223
Bennett, Stephen Lamar	229, 250	Bonilla, Luis	231
Bennett-Clark, Suzanne	248	Boone, Patricia	243
Benninghoff, Daniel W.	246	Booth, Carl B.	225, 243
Benoit, Edith B.	243	Boothe, Robert L.	227
Berdon, Walter E.	230, 252	Bora, Sunder S.	240
Berg, Marc L.	258	Bordiuk, Joseph M.	228, 246
Berger, Agnes P.	248	Borek, Ernest	239
Berger, Milton M.	250	Boris, Jacob	228, 247
Bergner, Lawrence	248	Borsky, Paul N.	249
Berl, Soll	242	Boschenstein, Frank K.	225
Berlin, Frederick	259	Bossart, Peter A.	254
Berman, Charles L.	259	Bourne, Henry R.	224
Bernal, Eva B.	243	Bowden, Charles	230
Bernard, Viola W.	229, 248, 250	Bowe, Edward T.	226, 232, 244
Bernards, Walter C.	222, 239	Bowen, Florry P.	243
Bernhard, William	246	Bowens, Jr., Mark A.	225
Bernot, Robert	239	Bowman, Frederick O.	231, 253
Berry, Frank B.	238	Bradford, Mary E.	228, 247
Bertles, John F.	224, 241	Bradley, Geraldine P.	224, 240
Bertrand, Charles A.	241	Bradley, Stanley E.	210, 211, 223, 234, 235, 240
Bertsch, Robert G.	231, 232, 253	Bradlow, Paul A.	251
Besen, Gerald H.	259	Bragg, Everett C.	227, 245
Beskyd, Peter P.	252	Bragg, III, Franklin E.	224
Bethke, Emil G.	244	Braham, Stanley B.	232, 254
Bettini, Guglielmina	222	Braida, Alfred J.	258
Beube, Frank E.	236, 259	Branche George C.	241
Bhonslay, Shivaji B.	231, 234, 253	Branche, Matthew D.	254
Bickerman, Hylian A.	224, 240	Brand, Leonard	222, 239
Bierman, Robert H.	228, 247	Brandon, Dorothy K.	232, 254
Bigger, Jr., John T.	223, 240	Brandt, Philip W.	238
Bilchick, Edwin B.	227	Bransilver, Belinda	228
Binder, Richard A.	225	Braun, Carl W.	225, 243
Bingham, William F.	225	Braverman, Albert S.	225
Binkert, A. J.	208, 210, 211, 235, 249	Brennan, Jr., John T.	254
Birnbaum, Gary	228	Brenner, Richard W.	254
Bissell, LeClaire	224	Breniske, John F.	244
Bito, Laszlo	244	Breuer, Jack M.	258
Blabey, Jr., Robert	232	Brewer, Alfred E.	224, 240
Blackmon, Lillian R.	229	Brickner, Philip W.	224, 241
Blackwood, Carlton E.	244	Bridges, Thomas J.	225
Blair, Charles R.	254	Briere, Alix L.	246
Blake, Melvin N.	245	Briggs, John Philip	229, 250
Blakemore, Arthur H.	222	Bright, Evelyn F.	243
Blanc, William A.	227, 245	Brill, Henry	251
Blancato, Louis S.	239	Briscoe, Anne M.	239, 241
Blank, Martin	234, 247	Brisman, Ronald	225, 226
Blasberg, Ronald G.	226	Britten, John S.	224, 247
Blechman, Abraham M.	258	Britten, Mary X.	243
Blechman, Martin G.	249	Brod, Morton S.	248
Bless, Stuart D.	225	Broden, Alexander R.	251
Block, Philip	259	Brodey, Marvin	223, 240
Block, Stanley	229	Brodie, Keith	230
Bloom, Stanley	232	Brodsky, Sidney J.	229
Bloomfield, Martin E.	241	Brody, Michael	230
Blum, Jr., Alexander	228, 246	Bronson, Winifred	224
Blum, Bertram	258	Brooks, Mary J.	243
Blum, Howard I.	259	Broom, William B.	222
Blume, Ralph S.	224	Brosnan, Frances C. F.	242, 253
Blumenstock, David A.	253	Brown, Donald E.	246
Blumenthal, Marvin R.	247	Brown, Geraldine S.	242, 243
		Brown, Gregory N.	246
		Brown, Harold W.	210, 248
		Brown, Howard D. H.	226
		Brown, Howard J.	249
		Brown, James A.	224
		Brown, Linda N.	243
		Brown, Paul M.	228
		Brown, Virginia M.	248
		Brown, Jr., Walter U.	222
		Brown, William	251
		Brownlee, William H.	251
		Brownstein, Shale	252
		Bruce, Gordon M.	222, 238, 244
		Bruck, Harold M.	231
		Bruenn, Howard G.	223, 240
		Brunngraber, Elinor F.	239
		Brunnstrom, Signe	253
		Bruno Sebastian A.	223, 259
		Brunswick, Ann F.	249
		Brush, John M.	228
		Brust, John C.	226, 243
		Brust, Raymond	231
		Brzustowicz, Stanislaw H.	259
		Buchanan, John L.	223, 240
		Buckholz, Patricia K.	243
		Buckingham, Sue	228, 246
		Buda, Joseph A.	231, 253
		Budinger, John M.	246
		Budowsky, Jack	223, 259
		Bufkin, William J.	226
		Bull, Marcia B.	224
		Bull, Sherman A.	231, 253
		Bullock, Samuel C.	249, 250
		Bunge, Mary B.	238
		Bunge, Richard P.	238
		Buonano, Aurelio	251
		Burch, Robert E.	240
		Burget, Gary C.	232
		Burgher, Clarence M.	253
		Burris, John O.	223, 240
		Bush, Jr., Harry L.	232
		Bushel, Arthur	248
		Butler, J. Campbell	249
		Butler, Jr., Vincent P.	223, 232, 240
		Butnick, Roland	223, 232
		Button, Jr., William H.	241
		Butts, Hugh F.	252
		Bysshe, Stanley M.	224, 226, 234
		Caffey, John	222, 238
		Cahn, Lester R.	223, 238, 246
		Cain, Jr., Edward A.	236, 259
		Caldwell, Peter R. B.	223, 240
		Caldwell, Thomas B.	222
		Califano, Paul F.	229, 250
		Callahan, Mary E.	253
		Calvin, Harold	255
		Cameran, Elliott N.	249
		Cameron, Airlee A. C.	242
		Campbell, Charles J.	226, 244
		Campbell, M. Edwina	224
		Campbell, Robert J.	248, 250
		Campbell, William L.	226, 231
		Canfield, Robert E.	240

PAGE	PAGE	PAGE			
Cannaday, Royall G.....	225	Christian, Charles L.....	223, 240	Copenhaver, Wilfred M.....	238
Cannon, Joe H.....	247	Christmas, June J.....	252	Coppersmith, Harold M.....	241
Cannon, Paul J.....	223, 240	Christy, Nicholas P.....	224, 241	Corbitt, Theodore	253
Cannon, W. Dilworth.....	227	Chu, Luke S. W.....	253	Corcoran, Paul J.....	231, 252, 254
Cantor, Herman	259	Chui, David H.-K.....	240	Cordery, Joy	252
Cantor, Murray A.....	259	Chusid, Erwin L.....	224	Cordice, John W. V.....	234
Carabajal, Pilar G.....	227, 245	Chusid, Joseph G.....	225, 242	Cordier, Andrew W.....	234
Carberry, David M.....	254	Chutorian, Abe	225, 242, 246	Corey, Karin R.....	252
Carbonara, Peter N.....	245	Cinelli, Peter B.....	254	Corley, Glenna J.....	246
Carden, Jr., George A.....	223, 240	Cinque, Salvatore G.....	254	Cosgriff, Stuart W.....	223, 240
Cardona, Hernando	244	Cinquina, John E.....	259	Correll, James W.....	234
Carey, Jr., Edward J.....	253	Cizek, Louis I.....	247	Cosla, Horace W.....	253
Carmel, Peter W.....	225, 232, 242	Clark, Graham	226, 244	Cosman, Bard	231, 234, 253
Carmical, Neville W.....	227	Clark, Irwin	239, 245	Coss, Jr., James A.....	224, 241
Caronia, Victor S.....	259	Clark, Robert	224	Costa, John L.....	229
Carpendale, Michael T. F.....	225, 253	Clark, Wilder C.....	251	Costa, Joseph A.....	228, 246
Carpenter, Malcolm B.....	235, 238	Clarke, Hans T.....	238	Costantin, LeRoy C.....	247
Carr, Arthur C.....	250	Clay, Clement C.....	248	Cote, Lucien J.....	225, 242
Carrion, Arturo L.....	240	Cleary, Constance P.....	243	Cotter, Lawrence H.....	224
Carroll, Frank D.....	226, 244	Cleveland, Marion D.....	210, 219, 243	Cotton, John	252
Carroll, Robert E.....	227, 245	Cleveland, Mather	222	Countee, Roger W.....	232
Carsten, Arland L.....	243	Clouet, Doris H.....	231	Courmand, Andre F.....	222, 238, 241
Carter, Rodman D.....	253, 254	Co, Cayetano C.....	231	Coward, Joe E.....	242, 243
Carter, Sidney	210, 225, 234, 242	Cocchiarella, Antonio	231, 252	Cowen, David	227, 242, 245
Casarella, William J.....	231	Cochran, George Van B.....	245	Cowen, Norman J.....	227
Casat, Charles D.....	230	Coelho, Jaine B.....	240	Cox, Ila S.....	243
Casazza, Albert R.....	241	Coen, Stanley J.....	251	Coyle, James G.....	258
Case, Robert B.....	224, 241	Coffery, Jr., Edward L.....	228	Craig, Frederick S.....	227, 245
Casey, Murray	226	Cohen, Barry	228	Cramer, Fritz J.....	222
Cassebaum, William H.....	254	Cohen, Elsa B.....	228, 230	Crampton, Richard S.....	224, 242
Cassileth, Peter	225	Cohen, Gerald	239, 250	Crandell, DeWitt L.....	229, 249, 250
Cassotta, Louis	251	Cohen, Harvey R.....	249	Cranefield, Paul F.....	247
Cassuto, Era	239	Cohen, Harry	223	Crawford, Mary I.....	
Castany, Rene J.....	232	Cohen, Max P.....	250	210, 234, 235, 243	
Cattell, James P.....	229, 250	Cohen, Milton	249	Crikelair, George F.....	211, 231, 253
Cavanagh, William V.....	226	Cohen, Roger D.....	231, 253	Cromie, John B.....	241
Cave, Herbert G.....	239	Cohen, Sidney M.....	243	Cropper, Jean B.....	249
Caveness, William F.....	242	Cohen, Solomon J.....	246	Crowley, Robert E.....	259
Cederquist, John W.....	229, 250	Coigney, Rodolphe L.....	249	Crupi, Claudio	227
Cesar, Reynold	222	Colcher, Henry	224, 240	Cuckler, Ashton C.....	248
Cesterio, Jorge L.....	241	Cole, Raymond M.....	227, 245	Culleton, James F.....	225, 243
Chaikin, Bernard S.....	259	Cole, Robert M.....	258	Cunnick, William R.....	241
Challenor, Wasoma B.....	253	Coleman, D. Jackson.....	226, 244	Cunningham, James K.....	224, 241
Chaitman, Edmund	230	Coleman, Louise	250	Curl, M. Diane	258
Chang, Chu Huai.....	230, 252	Collard, Jean E.....	241	Curnen, Jr., Edward C.....	
Chang, Min-Tang	222	Collett, Barbara A.....	243	210, 211, 228, 234, 235, 246	
Chao, Solan	225, 226, 244	Collette, Patricia J.....	250	Curran, George L.....	210, 223, 240
Chargaff, Erwin	239	Collier, Hal F.....	231	Curth, Helen O.....	223
Charlton, Maurice H.....	225, 232, 242	Collins, James U.....	222	Curth, William	223
Charney, Philip	223	Colman, J. Douglas.....	249	Curtin, William	226
Chayes, Charles M.....	258	Colmore, Henry P.....	224, 241	Curtis, Paul	225
Chen, Bei-Loo	238	Colombotos, John L.....	248	Cushman, Paul	224, 241
Cherkasky, Martin	249	Comas, Arsenio	226	Cuttita, Joseph A.....	223, 236, 259
Cherrick, Gilbert R.....	242	Conan, Neal J.....	224, 241	Daglian, Kourken A.....	223, 258
Chertoff, Harvey R.....	230	Conklin, Edward F.....	254	Daley, John M.....	224, 240
Cherubin, Charles B.....	250	Conley, John J.....	227, 245	D'Alton, Clarence J.....	223, 240
Chess, Leonard	225	Conroy, Richard J.....	241	Dalton, Dennis	230
Chiarandini, Dante J.....	243	Cook, J. Carter	239	Dammann, Gloria L. A.....	248
Chien, Kuang Chung Hu.....	240	Cook, John A.....	229, 250	Damon, Virgil G.....	222, 244
Chien, Shu	247	Cooper, Arnold M.....	229, 250	Damrosch, Douglas S.....	
Chilton, Neal W.....	249	Cooper, Barry C.....	259	228, 234, 235, 246	
Chisholm, Dan P.....	231	Cooper, Jr., George W.....	238	Daniel, Salha S.....	239
Chui, David H.....	225	Cooper, Henry S. F.....	231	Daniels, George E.....	222
Christakis, George J.....	249	Cooper, William C.....	226, 244		

PAGE	PAGE	PAGE			
Danielski, Edward	252	Diener, Harry	250	Ehrlich, Carol H.	245
Danoff, Dudley S.	232	DiGrande, Elaine V.	223	Ehrlich, Gabriele	244
Darling, Robert C.	210, 211, 231, 252	Dillenberg, Stanley M.	243	Ehrlich, Richard M.	232
Darrell, Richard W.	226, 244	Dillon, Donald J.	251	Einbinder, Julia M.	240
Daut, Ellen D.	228	Dilworth, Agnes D.	241	Eisenberg, Max A.	234, 239
David, William J.	229	Di Mango, Anthony L.	258	Eisenbud, Leon	258
Davidson, Arthur T.	254	Dimauro, Robert	231	Eisenstein, T. Donald	228, 247
Davidson, David B.	232	Dingwall, Deborah	243	Eisert, Jack	223, 240
Davidson, Ezra C.	244	Dinin, Benjamin G.	249	Elftman, Herbert O.	238
Davidson, Henry A.	249, 251	DiRe, John J.	246	Elinson, Jack	248
Davis, Elizabeth B.	229, 252	Dirkmaat, Joan M.	243	Elliott, Jr., Robert H. E.	219, 231, 234, 235, 253
Davis, John S.	241	DiSalvo, Nicholas A.	236, 258	Ellis, Kent	230, 234, 252
Day, Robert McC.	226, 244	Dische, Zacharias	238, 244	Ellis, Nancy B.	253
Dayan, Jean	239	Djaldetti, Meir A.	225	Ellner, Paul D.	225, 242
Deakins, Susan M.	224	Dohrenwend, Bruce P.	248, 250	Ellsworth, Robert M.	226, 244
Deal, Walter J.	243	Domonkos, Anthony N.	223, 240	Elvove, Robert M.	230
Dean, John van B.	223, 240	Donaldson, Kenneth T.	241	Ely, Charles A.	234, 238
Debbes, Elias G.	239	Donham, Robert T.	222	Emmers, Raimond	247
DeBellis, Robert H.	224, 240	Donn, Anthony	226, 244	Enderle, Erna S.	224
Decena, Jr., Benico F.	232	Donnenfeld, Hyman	246	Endicott, Jean	251
Decker, Elisabeth B.	228	Donovan, Edward J.	222	Engel, Andrea S.	222
Dede, J. Anthony	226	Donovan, John V.	259	Engel, Knud	246
Deesen, Kenneth C.	259	Donovan, J. Timothy	232, 254	Engel, Tibor	226
Defendini, Richard F.	225, 246	Donovan, Ruth U.	228, 247	Enson, Yale	224, 241
DeFries, Zira	229, 250	Donovan, William R.	248	Epstein, Robert M.	222, 234, 238
Degelsmith, Douglas	224	Dotti, Louis B.	249	Epstein, Stefane	246
DeHaan, Clayton R.	254	Dougherty, Louis J.	232, 254	Erganian, Jane A.	228, 247
DeHirsch, Katrina	247	Downey, John A.	231, 234, 252	Erhardt, Carl L.	248
Deitch, Arline D.	242	Downs, Elinor F.	228, 248	Erv, Alfred	259
DeJulia, Joseph A.	259	Downs, Sidney	231	Erlanger, Bernard F.	234, 242
Delbanco, Thomas L.	241	Driscoll, Rose A.	243	Erlenmeyer-Kimling, Loise	251
De Lisi, Joseph C.	259	Driscoll, Yvonne T.	228, 247	Eryol, Azak S.	246
Dell, Ralph B.	228, 246	Driscoll, Jr., John M.	229	Esecover, Harold B.	229, 251
Dellenbach, Robert J.	247	Drusin, Ronald	224	Espy, John W.	226, 244
DelMar, Margaret	219	Druss, Richard	229, 251	Esrig, Aaron	231
Demartini, Felix E.	223, 240	Duane, Jr., Richard B.	223, 240	Esselstyn, Cadwell B.	249
Demento, Frank J.	223	Dubin, Howard V.	225	Esser, Robert A.	225
Dempsey, Edward W.	234, 235, 236	Dubo, Hyman C.	231	Estes, Dorothy	224, 240
deNapoli, Robert A.	225, 243	Dubovy, Carl	228	Estrin, Elsizabeth G.	228, 247
Denckla, Martha B.	225, 226	Duc, Gabriel	229	Etra, Bernard	228, 247
Denning, Carolyn R.	228, 246	Ducker, Paul J.	230	Evans, Hugh E.	228, 247
Derby, Bernice R.	243	Duffy, Philip E.	227, 242, 245	Evans, Robert W.	250
deRoeth, Jr., Andrew	226, 244	Dunham, C. Dary	223	Exconde, Felix V.	226
DeRossi, Robert V.	228	Dunnington, John H.	210, 222, 238		
Derrick, John B.	248	Dunton, Harlow D.	229, 250		
DeSanctis, Peter N.	232, 254	Duvoisin, Roger C.	225, 242		
DeSeipio, Frank J.	249	Dvoskin, Samuel	224, 241		
deSilva, Stella	229	Dwyer, Edward M.	241		
D'Esopo, D. Anthony	210, 222, 238	Dyer, William R.	225		
Deutsch, Adelaide A.	253	Dyrenfurth, Inge	244		
Deutsch, Stephan D.	232				
Devlin, Raymond A.	251				
DeVoe, Arthur Gerard	210, 226, 234, 235, 244				
Dexter, David D.	239				
Diamond, Leonard	251				
Diamond, Oscar K.	252				
Dick, Frederick S.	232				
Dick, Harold M.	227, 245				
Dickinson, Ruth	253				
Dickinson, Seldin	254				
Dickson, Donald G.	248				
Dicmonas, Elsa J. G.	253				

PAGE	PAGE	PAGE
Feinsmith, Burton M.....228, 253	Follett, David A.....231	Gardner, Robert A.....232
Feinstein, Robert P.....223	Fong, Harry241	Garitano, William W.....230, 251, 254
Felch, William C.....224	Forbes, Max226, 244	Garnant, Jack W.....228
Feldman, Bernard R.....228, 247	Ford, Jr., Douglas.....228, 247	Garnes, Arthur L.....254
Feldman, Frieda230, 252	Forde, Kenneth A.....231, 254	Garnes, Harold A.....254
Feldman, Matthew228	Forester, Bruce230	Garret, Rudolph246
Feldstein, Stanley251	Forrest, Arnold W.....226, 244	Garst, Walter P.....232, 253
Felix, Marie D.....238	Forrest, David V.....230	Gaston, Swanie R.....227, 245
Felton, Charles P.....241	Forster, Eugene S.....229, 250	Gates, Marguerite J.....228, 246
Felton, Hiroko T.....244	Foster, Goodwin L.....238	Gavis, Gustave228, 247
Feminella, John232	Foster, Pearl D.....241	Gaylin, Sheldon G.....229, 249, 250
Fenton, Arnold N.....226, 244	Foster, Robert227	Gaylin, Willard M.....250
Ferin, Michael244	Foster, Stanley C.....231	Gearing, Francis R.....248
Ferrebe, Joseph W.....241	Fox, Jr., Charles L.....242	Geddes, Ian C.....223
Ferrer, Jr., Jose M.....231, 253	Fox, Lavinia G. M.....228	Geiger, Arnold M.....259
Ferrer, M. Irené.....223, 240	Fragola, Louis A.....240	Geiffuss, Charles A.....231
Fertig, John W.....230, 248	Fragoyannis, Stylianos G.....246	Gelband, Henry229
Feuer, Charles R.....231, 252	Frame, John D.....248	Gelbard, Hyman228
Fiasconrao, Joseph E.....259	Fances, Jr., Allen230	Gelber, Rene L.....232
Fidler, Gail S.....253	Franciscus, Marie L.....253	Gelfand, Michael231, 253
Field, William W.....224, 241	Francois, Egel249	Geller, Lester M.....245
Fields, James P.....240	Frank, Kenneth251	Gelman, Ann K.....248
Fields, Martin J.....259	Frank, Marjorie H.....254	Gerardi, Anthony224, 241
Fierer, Joshua227	Frankel, Olga228, 250	Gerbi, Claudio224, 241
Fieve, Ronald R.....229, 250	Franklin, C. Ray.....226	Germain, Mary M.....243
Finby, Nathaniel252	Franklin, David N.....228, 247	Gersony, Welton M.....231, 246
Findlay, Jr., Charles W.....231, 253	Frantz, Andrew G.....223, 240	Gerst, Paul H.....231, 253
Fine, Charlotte M. R.....252	Frantz, Angus M.....222	Gevas, Peter D.....231, 252
Fingerhut, Bruno254	Fraser, Richard A. R.....225	Gibbon, John251
Fink, Louis228	Fraser, Robert W.....254	Gibson, Edward L.....222, 239
Finke, Stanley R.....241	Frazier, Shervert235, 250	Gidro-Frank, Lothar229, 250
Finkelstein, Ludmila S.....231, 253	Freda, Vincent J.....226, 244, 246	Gilbert, Gloria H.....243
Finn, James E.....225	Frederickson, Keville M.....243	Gilbert, Harry249
Finster, Mieczyslaw222, 239	Freeman, Gerald S.....231	Gilbert, Louis J.....229, 250
Firdman, Marvin259	Freeman, Harold P.....254	Gilbert, Jr., Stanley H.....229, 247
Firestein, Stephen K.....250, 258	Freeman, Mahlon V.....226	Gilder, Jr., Rodman230, 250
Fischer, Peter B.....229	Frick, II, Henry Clay.....226, 244	Gill, Elizabeth S.....238
Fish, George W.....222, 238	Friedberg, Eugene A.....229, 251	Gilman, Sidney225, 239
Fisher, Andrea L.....243	Friedberg, Michael A.....232	Ginard, Antonio223
Fisher, Anita251	Friedman, Arnold P.....225, 242	Ginsburg, Iona H.....230, 251
Fisher, Joseph232	Friedman, Jr., Edward A.....224	Ginsberg, Sara242
Fisher, Lloyd C.....224, 241	Friedman, Richard C.....230	Gissen, Aaron J.....222, 239
Fisher, Pearl R.....241	Friedrich, Rudolph H.....223, 236, 258	Gitman, Leo249
Fisher, Robert L.....259	Fritts, Jr., Harry W.....223, 240	Givan, Jr., Thurman B.....228, 246
Fisher, Susan228	Fritz, Herbert P.....259	Gladstone, Jonas M.....242
Fishler, Lois A.....230	Fu, Yao-Shi228	Gladstone, Wilma226
Fishman, Lawrence S.....226	Fuld, Stuart L.....231	Glasel, Jay A.....239
Fisk, Shirley C.....223, 234, 235, 240	Fullerton, William W.....239	Glasgold, Alvin227, 245
Sister Antony Marie (Fitzmaurice)249	Furey, Clement A.....232, 254	Glass, Leonard228, 247
Fitzpatrick, Hugh F.....254	Furman, Sylvan S.....249	Glavin, Richard J.....251
Flack, J. Vincent.....226, 244	Frurth, Jacob238, 246	Glen, Michael230
Flapan, Mark249, 251	Gabriele, P. Charles.....259	Glick, Alvin J.....230, 251
Flavia, John A.....259	Gaetz, Harold P.....246	Glick, B. William238
Fleiss, Joseph L.....248	Gallinek, Alfred225	Glick, Robert A.....230
Fleming, Thomas P.....234	Galton, Harry A.....258	Gliedman, Monroe M.....258
Fleming, William H.....231, 253	Galton, Robert249	Gliedman, Richard258
Flint, James F.....224	Gambino, S. Raymond.....245	Glusman, Murray229, 250
Flood, Charles A.....210, 223, 235, 240	Gamble, Robert L.....222	Goeke, David J.....223, 240
Flynn, John224	Gamboa, Eugenia226	Godman, Gabriel C.....242
Fodor, Peter232	Garber, C. Zent.....227, 246	Gold, Aaron M.....245, 254
Fogel, Gerald I.....230, 251	Garcia, Alexander227, 232, 245	Gold, Allen M.....239
Fogelberg, Earl V.....227	Garcia, Luis A.....240	Gold, Arnold P.....225, 242, 246
Foley, Archibald R.....229, 249, 250	Gardner, Lee R.....229, 251	Gold, George251
	Gardner, Richard A.....229, 251	Gold, Ruth Z.....248
		Goldart, Natalie248

PAGE	PAGE	PAGE			
Goldberg, Ivan K.....	230, 251	Greenberg, Abraham	258	Hanauer, Lonnie B.....	224
Goldberg, Mark A.....	225	Greenberg, Carolyn	222	Hand, Bernard R.....	223
Goldberg, Max	251	Greenberg, Saul N.....	258	Handelman, Dan G.....	229
Goldberg, Morrell	249	Greenberg, Susan	243	Handler, Bernard J.....	241
Goldburg, Mark	238, 242	Greenberger, Robert	226	Hands, Robert A.....	229
Golden, Ross	222	Greenblatt, Irving J.....	248	Hanford, John M.....	222
Goldenberg, Ivorbert	249	Greene, Lynne T.....	222, 231	Hanger, Franklin M.....	210, 222, 238
Goldensohn, Eli S.....	225, 242	Greenfield, Elliott C.....	227, 245	Hanks, Edgar C.....	210, 222, 238
Goldensohn, Sidney S.....	225	Greenfield, William	258	Hanson, Ervin E.....	225
Goldfarb, William	229, 252	Greenspan, Kenneth	230	Hardie, John	225
Goldin, Gurston D.....	229, 250	Greenspan, Stanley I.....	230	Hardof, Allan	229
Goldin, Joel	259	Gregerson, Magnus I.....	247	Haroldson, Jr., Olaf	227, 245
Goldin, Victor	229, 250	Grey, Ross M.....	245	Harris, Paul D.....	231
Goldman, George	250	Gribetz, Donald	228	Harris, Ronald D.....	231
Goldman, Jack J.....	248	Grieco, Michael H.....	224, 242	Harris, Ruth C.....	228, 246
Goldreyer, Bruce N.....	224	Griffiths, Sylvia P.....	228, 246	Harrison, James S.....	238
Goldsmith, Charles I.....	228	Grinnell, Robert S.....	231	Hart, Edward J.....	226
Goldstein, Irwin	224	Grinstead, Carl E.....	228	Harter, Donald H.....	225, 242
Goldstone, Jonas M.....	224	Grode, Marshall L.....	225	Harvey, Harold D.....	222, 238
Goldwater, Leonard J.....	248	Gripekoven, Price	227	Harvey, Rejane	223, 240
Gollance, Harvey	249	Grokoest, Albert W.....	223, 240	Harwood, Marjorie E.....	223
Gollub, Edith	239	Gross, Paul	222	Hashim, Sami A.....	248
Gongaware, Robert D.....	232	Gross, Stanley	246	Hatfield, Wendell B.....	224, 240
Gonick, Paul	232, 254	Grossbard, Lionel	223, 241	Hatterer, Myra S.....	251
Goodbody, Maurice F.....	242	Grossman, Bernard L.....	230	Haughton, James G.....	248
Goodman, DeWitt S.....	223, 240	Grossman, Bertram H.....	229, 247	Hawn, Clinton Van Z.....	246
Goodman, Edmund N.....	231, 253	Gruber, Michael L.....	229	Haworth, Sheila G.....	229
Goodman, Frank J.....	225	Gruenberg, Ernest M.....	229, 248, 250	Hayes, Constance J.....	229
Goodman, Fredric E.....	259	Grundfest, Harry	242	Hayashi, Hideo	243
Goodman, Irving	239, 253	Gruner, George	226	Hayt, Emanuel	248
Goodman, Jerome	230, 251	Guarin, Urbano K.....	254	Hayt, Jonathan	249
Goodman, Leon J.....	252	Guicherit, Iwan D.....	248	Healey, William V.....	254
Goodman, Reba	245	Gutnee, Vincent F.....	248	Hecht, Harvey L.....	231, 252
Goodman, Reba M.....	255	Gump, Frank E.....	231, 253	Hechtman, Herbert B.....	253
Goodman, Robert L.....	225	Gurdjian, Edwin S.....	225	Hecos, Bernardette	238
Goodman, Sam	230	Gurewitsch, A. David	222, 252	Hefler, Stephen	229
Goodman, Soll	230, 250	Gurian, Harvey	251	Heilbrunn, Ernest	226
Goodman, Stephen F.....	259	Gurin, Lawrence R.....	258	Heissenbuttel, Robert	224
Goodwin, Paul N.....	252	Gurland, Barry J.....	251	Heller, Austin N.....	248
Gordon, I. Bruce	231	Gurpide, Erlio	239, 244	Heller, Sidney N.....	241
Gordon, Jr., William H.....	225, 243	Gutenstein, Beulah	247	Heller, Stanley S.....	230, 251
Gorman, John G.....	245	Guthrie, James R.....	228, 241	Helmick, Ruth	243
Gottardi-Massa, Brunella	231	Gutman, Alexander B.....	241	Hembree, III Wylie C.....	244
Gottsegen, Irving	249	Guttmann, Ruth J.....	252	Hendell, David	259
Grace, Russel R.....	232	Haagensen, Cushman D.....	222, 238, 253	Henderson, Mary	243
Grady, Frank J.....	222	Haber, Martha E.....	243	Hentin, Herbert	250
Graff, Ada M.....	239	Haberman, Paul W.....	249	Henley, Jean	239
Graff, Samuel	239	Habif, David V.....	231, 253	Hennig, George C.....	224, 240
Graham, Fiona	230, 251	Haffner, William H.....	226	Henry, Jack H.....	227
Graham, George W.....	249	Hagamen, Mary B.....	230	Hentel, Jack I.....	231
Granato, Roberto	254	Hagner, Dorothy K.....	243	Heppner, Richard L.....	224
Grandin, Dean J.....	226, 244	Haldeman, Jack C.....	249	Herlands, Robert E.....	259
Grann, Richard P.....	249	Hall, Eric J.....	252	Herman, Jr., Emory C.....	241
Grant, Edward V.....	249	Hall, Robert E.....	226, 244, 255	Hermann, William H.....	249
Grant, H. Michael	252	Hallock, Halford	227	Herr, Conrad E. A.....	222
Grant, Henry T.....	223	Halpin, Thomas F.....	226	Herr, George P.....	222
Grant, John P.....	232	Hamada, Satoshi	246	Hersh, Norman	230
Grantham, S. Ashby	227, 245	Hamilton, Gerald L.....	226	Herter, Frederic P.....	231, 253
Granzen, Roderick A.....	224	Hamilton, Jr., Lloyd A.....	230, 251	Herz, Marvin I.....	230, 250
Grayson, Alvin J.....	259	Hamilton, William G.....	227	Herz, Jr., Ralph J.....	224
Grayzel, Joseph	224	Hammer, Muriel	251	Hevenor, Engel P.....	254
Grebin, Burton	229	Hammill, James F.....	225, 242	Hiatt, Robert B.....	231, 253
Green, Albert	259	Hamon, Constance C.....	243	Higashino, Shoji	247
Green, Arthur A.....	230, 251			Hilal, Sadek	230, 252
Greenbaum, Lowell M.....	247			Hill, Constance	222

PAGE	PAGE	PAGE
Hill, Ruth F.....252	Hunt, Winslow R.....230, 251	Joselow, Morris M.....248
Hilleboe, Herman E.....248	Hurwitz, Herbert S.....229, 247	Joseph, Julian I.....248
Hilton, James G.....241	Hussey, Kathleen L.....248	Josephson, Eric.....248
Himmelfarb, Robert.....258	Hutchings, Donald E.....251	Ju, David M. C.....231, 253
Hindels, George W.....259	Hutchinson, John E.....240	Juhlin, Einar A.....233, 240
Hinds, Llynda M.....222, 239	Hutner, Marguerita S.....231, 253	Jurado, Roy A.....232
Hirsch, Donald R.....225	Hyder, Oliver Q.....230	Justice, Michael W.....254
Hirsch, Erwin O.....224, 241	Hyman, Allen I.....222, 239	Justman, Daniel.....230, 251
Hirsch, Robert L.....246	Hyman, George A.....223, 240	
Hirschfeld, Leonard.....259	Hyman, Sonia W.....230	
Hoberman, Morton.....231, 252	Hyslop, George H.....225	Kabat, Elvin A.....225, 242
Hochstetter, Werner.....229	Hyun, Bong H.....246	Kagen, Lawrence J.....224, 240
Hodas, Morton M.....230, 251		Kahn, Eric.....247
Hodes, Horace L.....228, 247	Iaquanta, Frank E.....241	Kaimakliotis, Elias M.....236, 241, 247
Hodge, Jr., Charles.....232	Ifarraquerri, Carlos.....230	Kalbacher, Joseph E.....228, 247
Hoefer, Paul F. A.....225, 242	Ingraham, Hollis S.....248	Kammerman, Sandra.....225
Hoefle, Frank B.....226, 244	Ingram, Vernon M.....241	Kandle, Roscoe P.....249
Hoehn, Margaret M. G.....225, 243	Ionascu, Nathan.....229	Kane, Rosamond.....227, 245
Hoehn, Robert J.....231, 253	Iorio, Philip M.....226	Kangos, John J.....229, 247
Hoekman, Theodore B.....243	Isaacs, George.....226	Kanter, Donald M.....224, 241
Hoffman, Brian F.....210, 229, 235, 236, 247	Ishii, Seiichi.....227	Kantor, Ira E.....230, 252
Hofmann, Frederick G.....247		Kantor, Martin.....230
Hogan, James A.....224, 241	Jack, Robert C.....227	Kanzler, Maureen B.....251
Hollander, Bentley.....231	Jacobs, Jerry C.....228, 234, 246	Kaplan, Gerald F.....232
Hollander, Melvin.....229	Jacobs, Martin H.....247	Kapit, Hanna E.....249, 251
Holliday, Houghton.....222, 258	Jacobs, Michael E.....224, 228	Kaplan, Jacob I.....258
Holmes, Hilary H.....223, 240	Jacobs, Thomas P.....225	Kaplan, Milton M.....244
Holt, Peter R.....241	Jacobson, Alvin R.....248	Kaplan, Joshua M.....254
Holub, Donald A.....223, 240	Jacox, Harold W.....230, 252	Kaplan, Nathan.....231, 252
Homan, Richard.....228	Jaeger, Roberta K.....230	Kaplan, Sidney.....254
Homan, William E.....228, 246	Jaffe, David.....230, 250	Karel, Irving A.....259
Hoover, A. Walter.....248	Jaffe, Joseph.....250	Karelitz-Karry, Marie.....223
Hopewell, William S.....242	James, Carolyn M.....258	Karis, James G.....239
Hopp, Dale E.....259	James, L. Stanley.....210, 227, 238, 246	Karis, Joannes H.....222, 239
Horn, James B.....258	Jameson, A. Gregory.....241	Karkas, John D.....239
Horowitz, Jacob.....249	Jampel, Robert S.....226, 244	Karl, William F.....239
Hosiosky, Ellen N.....259	Janecka, Ivo.....227	Karlan, Frances R.....259
Hoskin, Francis C. G.....239, 242	Jansky, Jeannette J.....247	Karlin, Arthur.....242, 247
Housepian, Edgar M.....225, 242	Jaretzki, III, Alfred.....231, 253	Karmiol, Mortimer.....259
Howard, Clifton M.....230, 251	Jarvik, Lissy F.....230, 250	Karol, Robert S.....224
Howard, Elliot J.....241	Jasaitis, Joseph E.....232	Karshan, Maxwell.....238
Howard, George M.....226, 244	Javert, Carl T.....244	Karush, Aaron.....229, 250
Howe, Calderon.....225, 235, 242	Jenkins, Farish A. T. R.....238, 250	Kassel, Robert L.....239
Howell, J. Taylor.....228	Jensen, Frode.....206, 207, 228, 247	Kastein, Shulamith.....245
Howes, Jr., Edward L.....228	Jensen, Philip B.....232	Katis, James G.....230, 251
Howie, Dennis P.....232	Jervis, George A.....229, 250	Katsampes, Chris P.....228
Howorth, Irving T.....249	Jesse, Mary J.....228, 246	Katz, Abraham.....222
Hoynak, Rose M.....243	Jewelewicz, Raphael.....226	Katz, George M.....242
Hoyle, Arthur H.....226	Jewett, Frank.....250	Katz, Michael D.....242
Hsu, Konrad C.....242	Johnson, Lewis A.....246	Katz, Ronald L.....222, 239
Hubby, Frank B.....229	Johnson, Paul K.....224, 240	Katz, Solomon L.....258
Huckaby, Jr., Henry L.....232	Johnson, Philip M.....230, 252	Katzenstein, Michael.....247, 228
Huddleston, Jean F.....241	Johnson, Thomas H.....222, 226	Katzive, Julius A.....248
Hucttner, Robert H.....258	Johnston, Austin D.....227, 245	Katzman, Merle H.....245
Hufnagel, Dorothy A.....223	Jones, Althea M.....253	Kaufman, John W.....249
Hughes, Edward F.....232	Jones, Barbara S.....240	Kaufman, Carole A.....243
Hughes, Horace H.....249	Jones, Camilla D.....228, 247	Kaufman, Edward.....251
Hughes, James E.....226	Jones, Edgar A.....251	Kaufman, Mavis.....245, 250
Hui, Robert M.....227, 232, 245	Jones, Ira Snow.....226, 244	Kaunitz, Hans.....224, 245
Humphreys, H. George H.....210, 211, 234, 235, 253	Jones, Julia B.....240	Kavaler, Florence.....249
Hunt, Howard F.....234, 250	Jones, Julia M.....241	Kaye, Gordon I.....245
Hunt, Jr., Irvin L.....236, 259	Joondeph, Norman H.....259	Kayman, Harvey.....229
	Jose, Jr., Alfredo Y.....232	Keating, Jr., John H.....242
		Keating, Richard P.....242
		Keenan, Richard.....239

PAGE	PAGE	PAGE
Keill, Stuart L.....230, 245, 251	Koike, Katsura	240
Keim, Hugo A.....227	Kolb, Lawrence C.	210, 211, 220, 234, 235, 250
Keller, Stephen244	Kolody, John T.....	249
Kellog, Marjorie252	Kopeloff, Lenore M.....	250
Kelly, Gordon227	Koplon, Burton S.....	223, 240
Kelly, William G.....244, 247	Kornfeld, Donald S.	210, 229, 234, 250
Kendall, Forrest E.....238, 239, 241	Kornfeld, Paul	250
Kennedy, James A.....224	Kossman, Richard J.....	226, 244
Kennedy, Lucy R.....234, 243	Koster, Seymour	258
Kennedy, William R.....227	Kothe, Beth L.....	243
Kent, Louisa M.....243	Kovalik, Anthony T. W.....	231, 254
Kerst, Richard N.....249	Kowarski, Szloma	247
Kesselbrenner, Israel252	Krakoff, Lawrence R.....	225
Kessler, Edward P.....259	Kramer, Theodore	227
Kessler, Harry S.....236, 242	Krant, David A.....	227
Kessler, Walter R.....211, 228, 246	Krause, John L.....	232, 253
Kestenbaum, Clarice J.....230, 251	Krauthamer, George M.....	242, 247
Ketenjian, Ara Y.....227	Krehbiel, Susannah	230
Khambatta, Hoshang	Kreisman, Dolores E.....	251
Khanna, Shyam M.....245	Kremzner, Leon T.....	239, 242
Khanna, Sumedka	Krenis, Lawrence J.....	223
Khella, Lewis	Krieger, Jerome	231
Kiechel, Frederic	Kritzler, Robert A.....	223, 240
Kilcoynd, Margaret M.....225	Krueger, Erich	242
Kildeberg, Poul A.....229, 246	Krugman, Robert	231
Killian, Paul	Kuehner, Charles R.....	232
Kim, Sang M.....231	Kuhn, Robert A.....	227
Kimberg, Daniel V.....223, 234, 240	Kumasaka, Yurihiko	251
Kimmey, James R.....249	Kumler, Fern	243
King, Donald L.....252, 230	Kumpe, David A.....	232
King, Donald W.	Kun, M. Susan	243
210, 227, 234, 235, 236, 245	Kunnes, Richard	226
King, Marvin B.....259	Kuo, Betty Chi Mei Lee.....	229
Kinley, Aleta	Kuo, Nicetas H.....	249
King, Mary E.....245	Kupchik, George J.....	249
Kinne, David W.....231, 253	Kurtz, Dorothy L.....	249
Kinney, John M.....231, 253	Kuske, Terrance T.....	241
Kinzel, Augustus	Kutner, Phillip	258
Kirchner, Corinne	Kutscher, Austin H.....	223, 236, 259
Kiriakopoulos, George	Kypson, Jindrich	239
Kister, Sven J.....231, 253	Labow, Theodore A.....	223, 240
Kitchin, Frank D.....240	Laderman, Peter	229, 251
Kistler, John P.....224	Laidlaw, Arthur E.....	247
Kitz, Richard J.....222, 239	Laird, Marion D.....	226
Kitzman, Mitchell L.....251	Lamb, Jr., Albert R.	223, 232, 235, 240
Klastin, Bertram	Lambert, Adrian	254
Klatsky, Stanley A.....232	Lambert, John P.....	229, 250
Klein, Henriette R.....251	LaMotte, Peter	254
Klein, Susan	Lancaster, William E.....	259
Kleinberg, David	Landau, Stanley J.....	232, 254
Kleinman, Abraham M.....245	Lane, Frederick M.....	251
Klenk, Eugene	Lane, Nathan	227, 245, 253
Kline, Nathan	Lang, Catherine I.....	241
Knapp, Philip	Lang, Robert R.....	227, 245
Knapp, Sally E.....248	Langer, Burton	259
Knaysi, George A.....232	Langford, William S.....	228, 250
Kneeland, Jr., Yale.....222, 210	Langmann, Alfred G.....	222
Kneeland, Yale	Lanks, Karl W.....	228
Knight, Katherine A.....243	Lansdown, Frances S.....	241
Knowlton, Abbie I.....233, 240	Lantzounis, Leonidas A.....	227
Knowlton, Jeanette	Lapkin, Michael L.....	229
Knox, W. Graham.....254		
Koenigsberger, Richard M.....254		
Koenigsberger, Richard M.....225		
Kohl, Schuyler G.....249		
	Laragh, John H.....	223, 240
	Laramore, Granville W.....	249
	Larson, Daniel L.....	223, 240
	Lasoff, Gustave	258
	LaSota, Eugene P.....	259
	Lassing, Larry W.....	229
	Latta, William B.....	222
	Lattes, Conrad G.....	231, 253
	Lattes, Raffaele	227, 234, 245, 253
	Lattimer, John K.	210, 211, 232, 234, 235, 254
	Lau, Tak-Ching	252
	Lauderdale, Jr., Vance.....	222, 239
	Laury, Gabriel V.....	230
	Lawler, H. Clair	251
	Lawrence, Margaret M.....	252
	Lax, Henry	224, 241
	Lazar, Norman David.....	229, 250
	Lazachek, Gary W.....	228
	Leader, Robert	245
	Leahay, Edward B.....	245
	Leavitt, Joseph M.....	232, 236, 259
	Leblanc, Wiener	247
	Leddy, Joseph P.....	227
	Lee, Arnold St. J.....	239
	Lee, Jr., Arthur B.....	232
	Lee, Milton	252
	Lee, William M.....	225
	Lefer, Leon	229, 251
	Leff, Alan M.....	222
	Lefkowitz, Nathan	251
	Lefkowitz, Robert J.....	224
	Legato, Marianne J.....	241
	Leidy, Grace A.....	247
	Leifer, Edgar	223, 240
	Leiter, Naomi	230
	Leisinger, Thomas	246
	Leland, James L.....	223, 241
	Lennon, Jr., Arthur J.....	227, 242
	Lennon, Richard C.....	227
	Lenz, Maurice	222, 238
	Leonides, John C.....	231
	Leppert, Phyllis C.....	243
	Lerner, Burton A.....	229, 251
	LeRoy, E. Carwile	223, 240
	Leschey, Jr., William H.....	226
	L'Esperance, Jr., Francis A.....	226, 244
	Lesse, Stanley	225, 243
	Lesser, Stanley R.....	250
	Leuzinger, Walo	239, 242
	Leuzzi, Anthony P.....	251
	Levay, Alexander N.....	230, 251
	Leventhal, Gerald H.....	225
	Levi, Michael M.....	244
	Levin, Arthur L.....	229
	Levin, Kenneth D.....	259
	Levine, Beulah A.....	249
	Levine, Jacob	249
	Levine, O. Robert	228, 246
	Levine, Richard U.....	226, 251
	Levitt, Lawrence I.....	251
	Levy, Louis I.....	229
	Levy, Magda	253
	Levy, Robert L.....	222, 238
	Lewis, John L.....	226, 244

PAGE	PAGE	PAGE
Lewis, John S.....245	Lozzi, Virginia	230
Lewis, Milena L.....241	Luban, Joseph	258
Li, Lu-Ku	Lubart, Joseph M.....229, 250	
Li, Ronald	Lubchansky, Isaac L.....230	
Liben, Florence G.....230, 249, 251	Lucca, John J.....236, 259	
Lichtenstein, Julia V.....224	Ludwig, Arthur S.....228	
Lichtman, Harry S.....249	Luhrmann, Jr., George.....230, 252	
Lieberman, Bernard L.....226	Luke, Wallace W. K.....252	
Lieberman, Gerald	Luse, Sarah A.....238	
Lieberman, Seymour	Lutz, Julia A.....243	
Liebert, Robert S.....230, 251	Lutz, Walter G.....230, 252	
Liebmann, Max	Lyons, George V.....259	
Liegner, Leonard M.....230, 251, 252		
Lifschitz, Martin I.....228, 247	McAllister, Ferdinand F.....	231, 234, 253
Lifson, Sol S.....249	McCabe, Robert E.....254	
Lightfoot, Robert W.....241	McCaffrey, Raymond M.....226, 244	
Lin, Irene C.....222	McCarthy, Jr., Eugene G.....249	
Lin, Robert Chin-erh.....239	McCarthy, Joseph	232
Lind, John K.....259	McClement, John H.....223, 240	
Lindaman, Francis C.....248	McClennan, Bruce	231
Lindenbaum, John	McCollester, Duncan L.....253	
Lindig, George F.....259	McConnell, David	224
Lindsay, Margaret J.....249	McCord, Colin W.....254	
Lindo, J. Trevor.....252	McCormack, Jr., George H.....	223, 240
Linn, Louis	Mccormick, Miriam A.....243	
Linz, Andrew M.....258	McCray, Richard S.....242	
Lipman, Marvin M.....224, 241	McCullough, Nancy	222
Lippitt, Theodora F.....225	McElroy, D. Keith	227, 245
Lipschitz, Martin I.....247	McFadden, Grace M.....249	
Lipton, Brian P.....230	McGroarty, John J.....227	
Lisio, Arnold L.....224, 241	McIntosh, Rustin	210, 222, 238
Lissenden, Carolkay L.....229, 247	McIntyre, John J.....259	
Littler, J. William	McIntyre, William M. J.....227	
Littman, Julius K.....238	McKinney, John McD.....225	
Lituchy, Stanley	McKinnon, Roger	250
Liu, Letty C.....222	McLain, Lee, W. J.....226, 243	
Liu, Philip L.....222	McLane, Kenneth A.....224, 240	
Livingston, Gideon E.....248	McLaren, Donald S.....248	
Lloyd, Kenneth O.....239, 240	McLaughlin, Harrison L.....	211, 227, 245
Lloyd, Putnam C.....223	McLaughlin, Mary C.....249	
Locke, Kenneth	McLean, Patricia A.....236, 258	
Lockshin, Michael D.....225	McMurtry, III, James G.....225, 242	
Loeb, John N.....222, 234, 240	McNeil, Christopher	225
Loeb, Robert F.....210, 222, 238	McNulty, Edward C.....259	
Loewenfeld, Irene	McSorley, John III.....225	
Loewenstein, Regina	MacArol, Veronika	225
Loewenstein, Werner R.....234, 247	Macdonald, Aildred A.....228	
Logerfo, Paul	MacDonald, James A.....254	
Lombardo, Peter C.....223, 240	MacDonald, Jeffrey	232
Lomfo, Alberto M.....244	Maas, Anna G. A.....253	
Long, Calvin	Machek, Jiri	242
Long, Margaret E.....246	Mackay, Mary C.....229, 251	
Longo, Frank W.....232, 254	Macken, Daniel L.....224	
Loscalzo, Louis J.....258	Macken, Kevin L.....252	
Loud, Alden V.....245	Mackie, Robert W.....253	
Loughlin, Francis J.....258	MacKinnon, Roger A.....229, 232, 234	
Lovejoy, Robert R.....248	Maclean, Neil M.....230, 251	
Lovejoy, William P.....224, 241	MacLeish, Catharine	229
Lovlace, Robert E.....225, 242	Macmillan, Roger	232
Lovell, F. Maurice.....239	Magill, Thomas G.....231	
Lovingcr, Gerald G.....243	Mahfouz, Amal, M. M.....243	
Low, Barbara W.....239	Maines, Susan C.....243	
Low, Niels L.....225, 242, 246		
Lowell, Richard J.....258		
Lowy, Samuel		

PAGE	PAGE	PAGE			
Ieselas, Harold	252	Mitchell, Doris J.....	246	Nachmansohn, David	238, 239, 243
felcher, Jr., George W.....	223, 241	Mitchell, Jr., Walter L.....	228, 247	Nag, Moni	255
elia, Daniel J.....	228, 247	Mohammed, Noelo	244	Nahas, Gabriel G.....	222, 238
elicow, Meyer M.....	232, 238, 254	Mohr, Brian	232	Nahoun, Henry I.....	258
elicow, Meyer M.....	232, 238, 254	Moldaver, Joseph	225	Naidorf, Irving J.....	259
fellana, Frank L.....	259	Moley, Malcolm	254	Nakajima, Shoichi	242
fellin, Gilbert W.....	210, 246	Moloshok, Ralph E.....	228, 246	Nakamura, Masanobu	222
fellins, Robert B.....	228, 246	Monahan, David M.....	259	Nakazawa, Hiroshi	246
feltzer, Herbert	239, 250	Monkcom, Wendy A.....	223	Nape, William	230
feltzer, Jay I.....	224, 240	Monroe, Janet I.....	243	Nash, Artemis D.....	246
feltzer, Theodore	230, 251	Montgomery, James	251	Nash, Lillian D.....	226, 244
fendelsohn, Frederick S.....	251	Mook, William H.....	241	Nassar, Sami I.....	228
fendell, Jerry R.....	228	Moolten, Sylvan	245	Nastuk, William L.....	247
fenken, Jane A.....	249, 255	Moore, Austin	230, 252	Natanblut, Faye C.....	225
fenken, Matthew V.....	226	Moore, David B.....	210, 226, 244	Nathan, Arthur	241
mercadante, James	259	Moore, Doris E.....	250	Nathanson, Bernard	258
mercuri, Osvaldo	225	Moore, Gordon D.....	227	Naven, Richard	249
Merriam, Jr., George R.....	211, 226, 244	Moore, Richmond L.....	222	Nay, Howard	254
Merritt, H. Houston	206, 208, 210, 211, 234, 235, 242	Moore, Sally A.....	244	Neer, II, Charles S.....	210, 227, 245
Merritt, Katharine K.....	228	Moore, Thomas J.....	228, 247	Neergaard, Arthur E.....	223
Merritt, Milton P.....	258	Mora, George	251	Neiditch, Wilmore	227, 245
Mertz, Philip	230	Moreinis, S. Abel.....	259	Nelan, John J.....	249
Mensnikoff, Alvin M.....	229, 250	Morello, Josephine A.....	242, 246	Nelson, Carl T.....	210, 211, 223, 234, 235, 240
Messer, Henry D.....	254	Morgan, Councilman	225, 242	Nemon, William J.....	230
Metcalf, Kenneth M.....	228	Morgan, Harry E.....	231, 239	Nesti, Frances	229
Mettler, Frederick A.....	238, 242	Morgolis, Carl I.....	228	Neu, Carmen O.....	240
Meyer, Karl	238, 241	Moriarty, Patrick E.....	231	Neu, Harold C.....	224, 240
Meyers, Donald I.....	251	Morishima, Akira	231	Neuberg, Hans W.....	224, 240, 259
Meyers, Helen C.....	229, 250	Morishima, Hisayo O.....	246	Neuwirth, Robert S.....	226, 244
Meyerson, Arthur	251	Morley, Jr., Kenneth C.....	253	Neviaser, Robert J.....	227
Michalke, Wolfgang	247	Morlock, Noel L.....	242	Newberg, Marc E.....	224
Michels, Robert	229, 251	Morris, Andrew L.....	222	Newman, George H.....	228
Michelson, W. Jost.....	225	Morris, Hennen C.....	226	Ngai, Shih-Hsun	222, 238
Mickey, Rhoda M.....	228, 247	Morris, Melvin	259	Ngo, Ignacia U.....	222
Middleton, Jr., Elliott.....	241	Morris, Thomas Q.....	224, 240	Nicholas, David D.....	229, 247
Mignogna, Frank W.....	227	Morse, Jane H.....	224, 240	Nicholson, John F.....	228, 246
Milano, Michael R.....	230	Mortati, Saverio G.....	230	Nikias, Mata K.....	249
Milici, John A.....	251	Moscarella, Alfred A.....	231, 254	Nisonson, Barton	232
Miller, Barnett M.....	254	Moschides, Elly M.....	246	Nisonson, Ian	232, 241
Miller, Dulcy	249	Moscovic, Edward A.....	246	Nixon, Daniel D.....	232
Miller, J. Lowry	222, 240	Morton, Robert	254	Noback, Charles R.....	238
Miller, Jacob D.....	230	Moses, Leon	229, 250	Noble, Robert P.....	224, 240
Miller, James	226	Moser, Paul W.....	251, 230	Nocenti, Mero R.....	236, 247
Miller, Jean K.....	252	Moskow, Bernard S.....	259	Noel, Gordon	224
Miller, III, John M.....	231, 232, 234, 252	Moskowitz, Joel A.....	230	Nonkin, Paul M.....	222, 239
Miller, Jordan	222	Moss, Hugh M.....	226, 244	Noonan, Richard J.....	249
Miller, Leon I.....	223	Moss, Leonard M.....	229, 251	Nordsiek, Frederic W.....	248
Miller, Louis H.....	230, 248	Moss, Melvin L.....	210, 223, 236, 238	Norman, David	231
Miller, Orlando J.....	226, 243	Mosse, Jonathan	254	Norman, Margaret G.....	228
Miller, Richard A.....	248, 249	Moulton, Ruth	250	Nossell, Hymie L.....	224, 240
Miller, Robert E.....	254	Mount, Frank W.....	249, 255	Nova, Harvey R.....	242
Miller, William	259	Mount, Lester A.....	211, 225, 234, 242	Oberhand, Robert I.....	227
Miller, William J.....	236, 259	Mudd, John W.....	225	O'Brien, Joseph E.....	245
Millet, John A. P.....	229	Mueller, Lois	243	O'Brien, Joseph L.....	225, 243
Milner, Max	248	Mufson, Isidor	224	O'Connell, C. Paul	226, 243
Miner, Walter	254	Muggia, Franco M.....	241	O'Connell, Daniel	249
Minervini, Donald	254	Mulder, Martien	232	O'Connor, John F.....	229, 250
Minervini, George A.....	258	Munnell, Equinn W.....	226, 244	Odrich, Ronald B.....	259
Mintz, Beatrice	248	Munsick, George	246	O'Grady, George L.....	236, 259
Mintz, Ira L.....	251	Munzer, Jean	252	Ohta, Hiroshi	225
Minzter, Albert	241	Murphy, Eugene F.....	258	Okagaki, Takashi	244, 245
Misheloff, Saul	259	Murray, Margaret R.....	238, 253	Olanow, Charles	226
		Murray, Thomas M.....	226	Oldham, John M.....	230
		Myers, Stanley J.....	231		
		Myerson, Daniel A.....	231		

PAGE	PAGE	PAGE	
Olds, David	230	Peckiyian, Rene	251
Oliven, John F.	229, 251	Pedersen, Hilda	222, 239
Oliver, Jr., Caldwell H.	227	Pepper, Bertram	249, 251
Olsen, Paul T.	251	Perel, James M.	239, 251
Ollstein, Ronald N.	254	Perera, Charles A.	226, 244
Olson, John E.	253	Perera, David R.	224
Oman, Carl R.	222, 258	Perera, George A.	223, 234, 235, 240
O'Neill, Francis J.	249, 251	Peretz, David	230, 251
O'Neill, Margaret A.	253	Perkins, Marvin E.	249
Opler, Stanley R.	245	Perkins, Ralph L.	249
Oppenheimer, Armand M.	258	Perkins, Richard P.	226
Ores, Celia	228, 247	Perl, Stanley M.	231
O'Rourke, Edward	247	Perrone, Hector	241
Orr, Walter J.	230	Perry, III, Samuel W.	230
Orr, William	228	Perry, William E.	250
Ort, Jan J.	222	Person, Ethel S.	251
Ort, Constance	243	Perzin, Karl H.	227, 234, 245
Ortiz-Neu, Carmen	243	Peters, Joseph P.	249
Oser, Bernard L.	248	Peters, Jr., Theodore	239
Oshrain, Herbert I.	259	Peto, Marjorie	243
Osler, Geoffrey F.	225, 243	Petrie, Roy H.	226
Osserman, Elliot F.	223, 245	Petrinovic, Marco	239
Osterberg, Eric R.	248	Petti, Michael J.	224
Ostreicher, Herbert P.	258	Pettit, Helen	243
Overholser, Winfred	229, 251	Philbin, Daniel M.	222, 239
Overweg, Norbert L. A.	253	Phillips, Cecil A.	254
Ovesey, Lionel	250	Phillips, Gerald B.	224, 241
Ozanics, Victoria	244	Phillips, Paul E.	225, 240
Ozawa, Hitoshi	239	Pianpiano, Jr., Joseph A.	259
Ozomek, Eliseo S.	222	Pickens, Robert L.	232
Paa, David F.	226	Pierson, Jr., Richard N.	224
Pacella, Bernard L.	229, 251	Pietri, Raul	225
Padilla, Elena	249	Pines, Kermit L.	223, 240
Page, Malcolm I.	241	Pino, Daniel M.	222, 239
Pai, Lucille Tsu	231, 253	Pisetsky, Joseph E.	251
Palesty, John	227	Piskacek, Vladimir R.	230
Pandolfo, Joseph A.	259	Pi-Sunyer, Francis X.	224, 242
Pansky, Ben	228	Pitman, Gerald	232
Paoli, Cesarina Enrica	230, 252	Pizzolato, Nicholas F.	229, 247
Papanek, George D.	251	Platman, Stanley R.	251
Papper, Emanuel M.	210, 222, 234, 235, 238	Platt, Mark	229
Pariser, Barry P.	227, 245	Plishner, Meyer J.	249
Park, Molly H.	249	Plotnick, Hermine D.	253
Parkc, Priscilla C.	243	Plotz, Charles M.	224
Parker, John W., Jr.	254	Poch, Herbert E.	228
Parker, Milford	252	Podleski, Thomas R.	243
Parks, Thomas J.	226, 244	Polatin, Alvin H.	229, 250
Parodi, Eduardo L.	232, 253	Polatin, Philip	229, 249
Parsons, William Barclay	210, 222, 238	Polk, Gene A.	247
Pasamanick, Benjamin	248	Pollack, Arthur C.	226, 232
Pasmantier, Mark W.	228	Pollack, Donald	241
Patchell, Robert D.	244	Pollack, William	246
Patrick, Jr., Thomas W.	229	Pomerance, Jeffrey J.	229
Pattcn, Bernard	226	Pons, Jr., Eduardo R.	224, 241
Patterson, Andrew H.	254	Pool, J. Lawrence	210, 225, 234, 235, 242
Patterson, Howard A.	241	Popio, Kenneth A.	224, 238
Patterson, Myron C.	241	Popoff, Nina	238
Patterson, Richard W.	222, 239	Poppers, Paul J.	222, 239
Pearl, Jon S.	228	Porter, Manuel J.	223
Pearson, Elizabeth Z.	243	Porter, Milton R.	210, 211, 253
Pearson, Linda	243	Porter, Vincent	254
Peasley, Edgar S.	241	Portway, Thomas W.	236, 259
Poslusny, Elsa	242	Poslusny, Elsa	242

PAGE	PAGE	PAGE	
Rettig, Arthur	232	Rosenstein, Solomon N.	223, 236, 258
Reul, Charles G.	226	Rosenstock, Lynne L.	222
Reyce, Cesar	239	Rosenthal, Theodore	226
Reynolds, Ralph X.	255	Roses, Allen	226
Rheingold, Stephan R.	224, 241	Rosmaita, John S.	229
Rice, Margaret M.	229, 247	Rosner, William	224, 241, 247
Richards, Dickinson W.	222, 238, 241	Ross, Samuel M.	247
Richards, Mary R.	228, 247	Rossi, Harald H.	252
Richards, Roderick C.	228, 247	Roswell, Charles G.	248.
Richardson, Harry B.	224	Roth, Jeffrey C.	229
Richard, Ralph M.	227, 234, 243, 245	Roth, Samuel J.	232
Richman, Alex	248	Rothenberg, Fred	258
Richter, Paul L.	226, 243	Rothenberg, Jerry	228
Richter, Ralph W.	225	Rothermel, Robert E.	249
Rider, Alan K.	224	Rothman, Jeffrey	228, 231
Ridley, Jeanne C.	248, 255	Rothner, Arnold D.	229
Rifkind, Richard A.	223, 235, 240	Rothschild, Carl	239
Rittenberg, David	210, 223, 234, 235, 236, 239	Rottenberg, Louis A.	230, 252
Rittler, M. Catherine	244	Rourke, Anthony J. J.	224, 249
Rivlin, Richard	224, 240	Roven, Robert B.	242
Rizkallah, Tawfik H.	226, 244	Royster, Thomas S.	254
Robbert, John H.	222	Rozen, Jack H.	223, 240
Robbins, Anne S.	230, 251	Rubin, David	229
Roberts, Kenneth	239, 244	Rubenstein, Joel	224
Roberts, Lloyd	246	Rubinstein, Leo	251
Roberts, Myron S.	232, 234, 254	Rucker, Charles	231
Roberts, Theophilus	234, 246	Rudensky, George	259
Robertson, Alexander	249	Rugh, Roberts	252
Robinson, Alan G.	224	Ruiz, Margarita F.	228
Robinson, Dorothy E. M.	243	Russell, Maurice V.	250
Robinson, John N.	231, 253	Rutschmann, Jacques	250
Rochester, Dudley F.	224, 241	Ryan, James H.	229, 250
Rodgers, James B.	254	Ryan, John F.	222, 239
Rodgers, John M.	224	Ryan, Stephen	246
Rodgers, Terry C.	229, 251	Ryder, Charles T.	227, 245
Rodosta, Frederick G.	232	Sabbia, Richard F.	246
Roe C. Francis	231	Sacks, Michael	230
Rogatz, Peter	249	Sagman, David L.	225, 243
Rogal, Phillip	224	Sahler, Otto D.	252
Rogers, Fred B.	249	St. John, Fordyce B.	210, 222, 238
Rogers, William M.	238	Saland, Joel S.	229
Roginsky, Martin S.	224	Salano, Linda C.	238
Roistacher, Seymour L.	258	Salanitre, Ernest	222, 232
Roizin, Leon	245, 250	Salentijn, Lenny	239
Romas, Nicholas A.	232	Salkind, Albert	259
Root, Walter S.	238	Salvatore, Anthony J.	223
Rose, Harry M.	210, 223, 225, 234, 235, 236, 242	Salvatore, Joseph E.	245
Roseboro, Anne H.	229	Samios, Nicholas	230
Rosen, Albert P.	228, 247	Salzinger, Suzanne	251
Rosen, David	225	Samuels, Mary H.	228, 247
Rosen, George	248	Sanaman, Michael L.	226
Rosen, Moshe	246	Sanders, Saul L.	223, 234, 240
Rosenberg, Arnold	258	Sanger, Bertram J.	223
Rosenberg, Phillip	242	Sanger, Grant	231, 253
Rosenberg, Roger N.	226	Sank, Diane	251
Rosenberg, Stanley E.	232, 254	Sanson, Peter	232
Rosenberger, John W.	230	Santos-Palomo, Victor	227
Rosenblum, G. Steven	230	Santulli, Thomas V.	210, 231, 253
Rosenfeld, Barbara	230	Sarcia, Sonja R.	229, 239
Rosenfeld, Eugene D.	248	Saren, Martin	248
Rosenkranz, Herbert J.	234, 242	Sarkisian, Sarkis S.	246
Rosenstein, Bernard	224	Sarlin, M. Bruce	251
		Satchell, David G.	243

PAGE	PAGE	PAGE	
Scudder, John	253	Solomon, Charles	259
Seaman, William B	210, 230, 234, 235, 252	Solomon, Gail E.....	226, 243
Searles, Harold F.....	251	Sommers, Sheldon C.....	245
Sebrell, Jr., William H.....	248	Sours, John A.....	229, 251
Seegal, Beatrice C.....	238, 242	Southam, Anna L.....	244
Seegal, David	222, 238, 241	Southworth, Hamilton	210, 223, 240
Segal, Barry M.....	224	Spain, David	245
Segal, Harvey	231	Spalding, Charles F.....	251
Segal, Martin E.....	249	Spalter, Harold F.....	226
Seidel, Albin R.....	222	Speck, William T.....	229
Sciden, Margaret R.....	225, 243	Spector, Abraham	244
Self, Edward B.....	231, 234, 253	Speert, Harold	244
Selleck, Nathaniel	224	Spencer, Herbert J.....	242
Sellner, Henry A.....	226	Spencer, Vernon F.....	249
Seneca, Harry	232, 254	Spengeman, Walter G.....	258
Senyszyn, John J.....	231	Sperry, Warren M.....	239, 250
Severinghaus, Aura E.....	238	Spiegel, Herbert	229, 250
Severino, Lawrence J.....	226, 244	Spina, Christopher	224
Severud, Olaf J.....	244	Spiro, David	245
Sevier, Robert E.....	224	Spitzer, Robert	251
Shaari-Tehrani, Mehdi	245	Spooner, Maryloo	224, 241
Shade, Madelyn M.....	243	Springer, Bettie H.....	243
Shaderowsky, Lawrence	230	Springer, Charlotte F.....	231, 253
Shainess, Natalie	251	Sprinson, David B.....	234, 235, 239
Shalsha, Lilli C.....	229, 251	Sprung, Katherine	228, 246
Shands, Harley C.....	252	Squatrito, Salvatore J.....	259
Shapiro, Daniel	250	Srinivasan, Parithycery	239
Shapiro, Herman	239	Srole, Leo	250
Shapiro, Irving S.....	248	Stachura, Irene	247
Shapiro, Joseph S.....	223	Stahl, Theodore J.....	224
Shapiro, Lewis	223, 240	Stanford, Gary B.....	227
Shapiro, Robert S.....	251	Stankewick, Walter R.....	228, 247
Shapiro, Sam	249	Stanley, Theodore H.....	222
Sharpe, Janet D.....	243	Stanley-Brown, Edward G.....	254
Sharpe, Lawrence	251	Stark, Richard B.....	254
Sharpe, Louis R.....	258	Starr, Wilson C.....	226, 244
Shattan, Boaz M.....	223, 258	Starr, Stuart	229
Shaver, Joyce C.....	224	Stearns, Sheldon W.....	230
Shaw, Anthony	254	Stearns, William H.....	224, 231, 241
Sheik Holeslam, Mehdi	227	Stebbins, Jr., James H.....	249
Sheinkopf, Harold N.....	222	Steeg, Carl N.....	229
Sheldon, Huntington	245	Steer, Charles M.....	210, 211, 226, 234, 235, 244
Sheils, William J.....	241	Steffens, Gloria M.....	243
Sheldon, Paul B.....	223	Steibel, William	259
Shelley, Edward M.....	230	Stein, Arthur	230, 251
Shelley, Eleanor V.....	253	Stein, Bennett M.....	225, 242
Shelton, Marvin L.....	227, 245	Stein, Joan	223
Shen, Edith K.....	229, 247	Stein, Sanford W.....	230
Shen, Shih-Chang	234, 238	Stein, Zena A.....	248
Shenkman, Samuel	254	Steinberg, Martin R.....	249
Shepardson, Robert	228	Steiner, Alfred	224, 240
Sheps, Cecil G.....	249	Steiner, Charles	225
Sheps, Mindel C.....	248, 255	Steiner, Jerome	230, 251
Shcr, Paul P.....	228	Steinerman, Stanley M.....	259
Sherman, Harold P.....	259	Steinman, Charles R.....	225
Sherman, Warren T.....	225, 241	Stinzor, Bernard	225
Sherman, William B.....	223, 241	Stella, Sergio R.....	225
Sherwood, Edward S.....	225	Stember, Richard H.....	230
Sherwood, Louis M.....	225	Stent, Theodore R.....	224
Shettles, Landrum B.....	226, 244	Stephensen, John A.....	247, 252
Shiller, Jack G.....	228, 247	Sterling, Kenneth	224, 241
Shimomura, Seiichi	242	Stern, Aaron	251
Shiratori, Tatsujii	240	Stern, Donald	225
Shookhoff, Howard B.....	224, 248	Stern, Martin	258

PAGE	PAGE	PAGE
ern, Morton J.....258	Tantibhedhyangkul, Phienvit.....229	Truman, David B.....234
euer, Irwin.....258	Tapley, Donald F.....223, 240	Trussell, Ray E.....234, 235, 248
evens, Jr., Ward W.....225	Tara, Harold H.....254	Tucci, Paul.....254
levenson, Stuart S.....228, 234, 247	Tarshis, Julius.....258	Tullis, John L.....246
ewart, Charles F.....254	Tasker, William G.....226	Tully, John G.....227
ewart, David W.....249	Taylor, Jr., Howard C.....210, 222, 238, 255	Tuoti, Ferdinand A.....259
ewart, Duncan E.....231	Taylor, Lawrence E.....254	Turgeon, Livia K.....249
ewart, E. Spencer.....232	Taylor, Reginald.....228, 251	Turino, Gerard M.....223, 240
tiles, David.....228, 247	Tchnag, Felix.....228	Turnauer, Elizabeth F.....229, 247
tinchfield, Frank E.....210, 211, 227, 234, 235, 245	Tease, Jean.....232, 243	Turner, Robert C.....254
tirt, Sonia S.....229	Tecuanhuey, Leopold V.....232	Tyson, Jr., Cornelius J.....224, 240
tock, Richard J.....223, 240	Teichner, Victor.....251	Tyson, T. Lloyd.....224, 241
toerk, Herbert C.....245	Teisch, Joel A.....223, 225	Tyton, Alex.....249
tokes, Shirley A.....243	Teixidor Hind S.....252	Uccellani, Ennio L.....236, 259
stoll, Frances A.....258	Teller, William.....226	Ufford, Elizabeth.....228, 247
stolnacke, Richard A.....249	Telsey, Daubert.....258	Ulan, Martin S.....250
stone, J. Gilbert.....223	Teltsch, Edward E.....258	Umhey, Charley.....259
Stone, Michael H.....230, 251	Temple, Robert J.....225	Underwood, Barbara A.....248
Stout, Arthur Purdy.....223	Temple, William E.....227	Untereker, John J.....253
Stout, Rex A.....223	Tenner, Michael S.....230, 252	Urm, Elo.....246
Strahl, Margaret O.....251	Tennyson, Virginia M.....246	Usami, Shunichi.....247
Straker, Hilda G.....223	Tepperberg, Jerome.....226	Uson, Aurelio C.....229, 232, 254
Straub, Anton J.....249	Terada, Masaaki.....225	Valcarel, Manta.....229
Strauss, Raymond B.....227, 245	Terenzio, Joseph V.....250, 258	Van Aalstine, Helen.....224
Strayer, III, Luther M.....227, 245	Terestman, Nettie.....251	Van Bockstae, Pierre G.....254
Striker, Paul S.....232	Terry, Jr., James H.....254	Van Canegham, Adrian.....241
Stroud, Franklin L.....229	Terzakas, John A.....246	Vande Wiele, Ramond L.....239, 243
Suarez, Luis.....223, 240	Thieman, Philip W.....232	Vandiveer, Janet C.....253
Suarez-Reyes, Luis.....223	Thomas, Chin-Shong E.....251	Van Dyke, Frank W.....248
Sullivan, Albert L.....225	Thomas, Elapumkal A.....222	van Dyke, Harry B.....238
Sullivan, Stuart F.....222, 239	Thomas, III, Henry M.....224, 240	Van Etten, Royal C.....222
Sullivan, Thomas J.....210, 229, 232, 254	Thomas, Joseph J.....226	Van Meter, Sharon H.....228
Sulman, Michael.....245	Thomas, Samuel F.....225, 243	Van Ness, Edward H.....250
Sun, Sally S.....225, 228	Thomas, Jr., William C.....248	Van Itallie, Theodore B.....224, 241
Suskin, William H.....259	Thompson, Errol A.....245	Van Praagh, Ian Gerald.....244
Susser, Mervyn W.....248	Thompson, James E.....254	Varman, Andrew A. O.....248
Sussman, Leonard.....229	Thompson, Jr., Roby C.....227	Varmus, Harold E.....225
Sutton, Samuel.....250	Thorne, Irving J.....254	Vassalo, Enrique M.....230
Svahn, David S.....225	Thornhill, Herbert L.....231, 252	Vayda, Cherry L.....249
Swanson, John L.....242	Thurer, Richard J.....231, 253	Veenema, Ralph J.....234, 254
Sward, Kathleen.....250	Thursh, Donald R.....246	Verdi, Jerold.....232
Swartz, Donald P.....225, 244	Ticnor, Amarylius A. O.....243	Verdisco, Loretta.....243
Swarz, Herbert.....225	Tietze, Christopher.....244	Verlin, William A.....258
Sweeney, Eugene W.....223	Tillman, Alvin J. B.....226, 244	Verosky, Mariagnes.....239
Sweeney, Joanne.....243	Tobin, Michael.....251	Vestergaard, Per B.....252
Sweeting, Joseph G.....224, 241	Todd, James S.....234, 253	Vicale, Carmine T.....225, 242
Swerdloff, Bluma.....250	Todd, Jean.....254	Vicari, Giuseppe.....242
Swift, Lucy H.....229, 247	Todd, W. Duane.....210, 234, 244	Vicens, Cristobal A.....224, 241
Symonds, Jr., Francis C.....231, 253	Tomasulo, Joseph.....228	Viederzman, Milton.....229, 251
Szalita, Alberta B.....250	Tonndorf, Juergen.....245	Villanueva, Raymond.....222
Szarzg, Ruth.....230	Tookooian, Hagop.....231	Vita, Martin B.....229, 247
Taggart, John V.....223, 234, 235, 236, 240, 247	Topal, Samuel.....226	Vitkainen, Kari J.....239
Takemora, Yoshihiro.....246	Torrens, Paul R.....249	Vnek, John.....243
Takizawa, Shoichi.....246	Torsney, Philip J.....224	Vogel, Henry J.....242, 245
Talmud, Blanche.....253	Torstenson, Barbara J.....243	Vogel, Howard B.....258
Tamerin, Joseph.....254	Tovell, Harold M. M.....244	Vogel, Ruth H.....246
Tamir, Hadassah.....239	Tracht, Myron E.....246	Vollmer, Edward C.....225
Tanenbaum, Stuart W.....242	Trapp, J. Douglas.....232	Volpis, Giovanni.....225
Tang, Peter H.....228	Trei, Alice R.....253	von Hofe, Frederick H.....228
Tannenbaum, Myron.....227, 232, 246, 254	Tretter, Patricia.....230, 252	von Lackum, William H.....227
	Tretter, Wolfgang.....226, 244	Von Miesky, Lajos.....244
	Trichter, Samuel.....250	Voorhees, Arthur B.....231, 253
	Triner, Lubos.....239	
	Trokel, Stephen L.....226, 244	

PAGE	PAGE	PAGE
Vosburgh, Gilbert J.....226, 244	West, Robert228, 247	Wolfman, Sarus23
Voskian, John B.....226	Westerhoff, Peter D.....227, 245	Wollowick, Herbert23
Vrachmos, Themisokalis232	Westfall, Jr., Franklin.....227	Wolmer, David H.....25
Vratsanos, Spyros M.....242	Wethers, Doris L.....228, 247	Wolnetz, Arthur K.....22
Wagner, Bernard M.....227, 245	Wharton, Ralph N.....229, 251	Woo, A. Stephen22
Waldkoetter, Sara243	Wheaton, Jr., Earl A.....224, 240	Wood, Ernest H.....210, 230, 25
Waldo, Albert L.....224	Wheeler, Edward M.....245	Wood, John A.....224, 24
Waldron, II, Robert L.....231, 252	Wheeler, Maynard C.....222	Wood, Karen K.....24
Walker, Howard Lee.....226	Wheeler, Robert C.....228, 247	Woodman, DeGraaf22
Wallace, David248	White, Abraham250	Woodruff, I. Ogden23
Wallace, Robert E.....248	White, III, Robert R.....254	Wotman, Stephen25
Walsh, Robert F.....259	Whitfield, Stanley245	Wray, Edwin O.....23
Waltner, Jules G.....227, 245	Whitlock, Robert T.....240	Wu, Anna Fang24
Walzer, Richard A.....223, 240	Whitten, William W.....247	Wu, Daisy Y.....232, 24
Wang, Carl C. T.....239	Whittier, John R.....252	Wu, Jo Hong24
Wang, Chung C.....249	Wichern, Walter254	Wurster, Richard23
Wang, Hsueh-Hwa234, 247	Wiedel, Philip D.....231, 235, 253	Wylie, Robert H.....210, 231, 235, 25
Wang, Shih-Chun234, 247	Wiener, Jerry M.....230, 251	Xethalis, John24
Warburton, Dorothy244	Wiener, Joseph245	Yahr, Melvin D.....225, 235, 24
Warren, Lucy DeS.....243	Wigger, H. Joachim227, 246	Yamagishi, Shunichi24
Warren, Michael P.....225	Wigle, Ronald225	Yannopoulos, Kaity24
Wasserman, Bernard H.....259	Wilcox, Daniel A.....228, 247	Yeaw, Ralph C.....232, 25
Waszczuk, Madeline230	Wilcox, Jr., Herbert B.....223, 234, 240	Yergan, Charles M.....24
Waterson, Jr., Karl W.....223, 240	Wilens, Sigmund L.....227, 245	Yiannakikos, Dimitrios J.....23
Watkins, Elizabeth B.....229, 247	Wilke, George H.....229, 251	Yoeh, Chin Bor254
Watkins, Melvin B.....227	Wilking, Leo F.....228, 247	York, Albert T.....227
Watson, Benjamin P.....210, 238	Wilking, Virginia N.....252	Young, Jr., Alexander W.....223, 240
Watson, Patrick223	Willettes, Arthur T.....225, 254	Yue, Shyh-Jong231, 253
Wax, Sander H.....232, 254	Williams, Gail225	Zablow, Leonard243
Weber, John250	Williams, Hugh R.....251	Zacharioudakis, Basil254
Webster, Jerome P.....222, 238	Williams, Roger W.....248	Zackai, Avram228, 224
Wechsler, Magdalena B.....230	Williamson, Susan W.....226, 244, 255	Zambra, Manuel T.....225
Weels, Josephine258	Willitts, Arthur T.....232	Zamelis, Ansia241
Wehrle, Mary Julie231	Wilner, George D.....228	Zanes, Anne S.....249
Weil, III, Richard253	Wilson, Agnes G.....247	Zapata-Martinez, Rafael229
Weiler, Martin E.....251	Wilson, Charles228, 231	Zawadsky, Joseph P.....227
Weinberg, Daniel247	Wilson, John M.....254	Zeff, Seymour258
Weinberg, Sidney B.....250	Wilson, Roger S.....222	Zegarelli, Edward V.....223, 236, 259
Weiner, Harvey L.....258	Windrow, Mary E.....243	Zeidenberg, Philip230
Weiner, Louis250	Winickoff, Richard N.....225	Zeisler, David259
Weinstein, Ephraim259	Winikoff, Donald Alvin247	Zeller, Jack A.....228
Weinstein, I. Bernard224, 240	Winikoff, Susan A.....243	Zeller, Roberts231
Weinstcin, Joel D.....227	Winikus, Winifred250	Zengo, Albert259
Wcir, III, James H.....226	Winocur, Manuel M.....245	Ziegler, Thomas W.....225, 259
Weiss, Benjamin239, 250	Winslow, T. Scudder254	Zikria, Bashir A.....253
Weiss, Bernie232	Winters, Robert W.....228, 246	Zimberg, Sheldon250, 252
Weiss, Martin246, 247, 254	Wirostko, Emil226, 244	Zimmering, Paula E.....239, 244
Weiss, Norman230	Wise, Carl R.	Zinsser, Hans H.....232, 254
Weiissberg, Josef H.....251	210, 211, 219, 224, 235, 240	Zintel, Harold A.....254
Weissman, Bruce227	Wishik, Samuel M.....248, 255	Zipf, Richard F.....227
Wcitzten, Hyman G.....225, 243	Wit, Andrew L.....247	Zitzmann, Eric K.....227
Wells, Josephine252	Witebsky, Frank G.....230	Zorick, Peter225
Welsch, Exic E.....229, 250	Witkovsky, Paul244, 247	Zorn, George L.....232
Wermer, Paul224	Wolarsky, Evan232	Zubin, Joscph250
Werner, Sidney C.....223, 240	Wolf, Abner222, 238, 242, 246	
Wertheim, Arthur R.....223, 240	Wolf, Charles E.....222, 239	
Weslcy, James E.....234	Wolf, Marianne246	
	Wolff, James A.....228, 246	



THE PRESBYTERIAN HOSPITAL
in the City of New York
622 West 168th Street, N. Y., N. Y. 10032



COLLEGE OF PHYSICIANS AND SURGEONS · COLUMBIA UNIVERSITY
in the City of New York
630 West 168th Street, N. Y., N. Y. 10032



ANNUAL REPORT 1969

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ELEVENTH COMBINED ANNUAL REPORT

of the

COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York, N. Y. 10032



College of Physicians and Surgeons · Columbia University
in the City of New York

School of Dental and Oral Surgery · Columbia University
in the City of New York

and

The Presbyterian Hospital in the City of New York

December 31, 1969

This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who prepare to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 7,500 people who serve and study within the Hospital and College, who give life and breath to this concept.

“Those who serve” include every worker — professional, non-professional, student and volunteer. These are the people who provide the best in patient care today and contribute toward advancement in health and medical science tomorrow.

Contents

ORIGIN AND FUNCTIONS OF THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER	1	TRUSTEES AND COMMITTEES	235
REPORT OF THE PRESIDENT		Trustees of Columbia University in the City of New York.....	236
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	5	Joint Administrative Board.....	237
REPORT OF THE PRESIDENT OF THE MEDICAL BOARD		Trustees of Columbia-Presbyterian Medical Center Fund, Inc.	237
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	10	Trustees and Officers of The Presbyterian Hospital in the City of New York.....	238
REPORT OF THE DEAN OF THE FACULTY OF MEDICINE		Committees of the Board of Trustees.....	240
COLLEGE OF PHYSICIANS AND SURGEONS.....	11	Medical Board	240
REPORTS OF DEPARTMENTS AND SERVICES.....	17	THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	243
Anatomy	18	Women's Auxiliaries	244
Anesthesiology	23	Members of the Corporation	247
Biochemistry	32	Administrative Staff	249
Dermatology	36	PROFESSIONAL STAFF	
Human Genetics and Development	39	THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	251
Medicine	43	Consultants	252
Microbiology	60	Chiefs of Clinics	262
Neurological Surgery	66	FACULTY OF MEDICINE	
Neurology	71	COLLEGE OF PHYSICIANS AND SURGEONS	
Nursing	82	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	263
Obstetrics and Gynecology	86	Officers of the Faculty.....	264
Ophthalmology	96	Committees of the Faculty.....	264
Orthopaedic Surgery	103	Joint Committees of Faculty of Medicine and Professional Staff of Presbyterian Hospital.....	265
Otolaryngology	109	SCHOOL OF DENTAL AND ORAL SURGERY	
Pathology	112	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	266
Pediatrics	119	Officers of the Faculty.....	266
Pharmacology	127	Academic Committees	266
Physiology	133	ACADEMIC STAFF	
Psychiatry	138	COLLEGE OF PHYSICIANS AND SURGEONS	
Public Health and Administrative Medicine	152	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	269
Radiology	163	Emeritus Officers	270
Rehabilitation Medicine	173	ACADEMIC STAFF	
Surgery	176	SCHOOL OF DENTAL AND ORAL SURGERY	
Urology	190	COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK	289
International Institute for the Study of Human Reproduction	196	Emeritus Officers	290
Institute of Cancer Research	203	APPENDIX	293
Institute of Comparative Medicine	207	THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	
Medical Library	209	Balance Sheet	294
REPORT OF THE DEAN OF THE FACULTY OF DENTAL AND ORAL SURGERY.....	213	Statement of Income	296
DENTAL AND ORAL SURGERY.....	217	Summary of Fund Changes	298
REPORT OF THE PUBLICATIONS OF MEMBERS OF THE PROFESSIONAL AND ACADEMIC STAFFS.....	220	Endowment Funds	300
REPORTS OF WOMEN'S AUXILIARIES		Accountant's Opinion and Report of Auditing Committee	302
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK	223	Group Retirement Plan	303
Board of Women Managers, Babies Hospital	224	Statistics	304
Cribside Social Service Committee	226	THE WOMEN'S AUXILIARIES	306
Mary Harkness Auxiliary	227	THE COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.	310
Neurological Institute Auxiliary	228	THE ALUMNAE ASSOCIATION, SCHOOL OF NURSING	312
Women's Auxiliary of the New York Orthopaedic Hospital	230	ENDOWED BEDS AND ROOMS	313
Women's Auxiliary of the Presbyterian Hospital	231	INDEX TO PROFESSIONAL AND ACADEMIC STAFFS	322

Origin and Functions of the Columbia-Presbyterian Medical Center

The Medical Center, comprising a group of long established hospitals of high standing and the College of Physicians and Surgeons of Columbia University, furnishes an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the hospitals and the University the members of the staffs of the hospitals are nominated by Columbia University, and teaching and research are conducted in all the hospitals.

College of Physicians and Surgeons

Columbia University began as King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was reopened as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the Trustees of the two institutions, the College of Physicians and Surgeons became the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the President of the College of Physicians and Surgeons.

The connection was only a nominal one, however, until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928, the College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. As a part of the Columbia-Presbyterian Medical Center, it is housed in a seventeen story, fire-resisting, steel, brick and concrete building, each floor connecting with the wards and services of Presbyterian Hospital.

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The School of Dental and Oral Surgery

In September, 1916, students in dentistry were admitted to courses in Columbia University at the College of Physicians and Surgeons. On March 15, 1917, the Trustees of Columbia University established a School of Dentistry as of September 27, 1916, so that the conduct of courses from that date, as forming part of the work of the School, might be officially recognized. The School was to be established "upon university lines," meaning "a school the requirements for admission to which shall be the same as those for admission to the Medical School and whose students shall then pursue a four year course, the first two years of which will be almost identical with the first two years of the course of Medicine. The last two years would be given to special preparation for dentistry and dental surgery."

Temporary quarters were utilized on West 39th Street, and in 1920 a small building was erected adjacent to the entrance of the College of Physicians and Surgeons on West 59th Street in which instruction was carried on until the spring of 1923. In the course of that spring and summer, negotiations for the merging of the College of Dental and Oral Surgery with the Dental School of Columbia University were completed and, in September, 1923,

the new institution became the School of Dental and Oral Surgery, established in the buildings of the older private corporation on East 35th Street. On completion of the Medical Center in 1928, the School moved to its present quarters where it is adjacent to the basic science departments of the University, the Medical Library and Vanderbilt Clinic.

The School provides undergraduate instruction in dentistry and dental hygiene. Postgraduate courses in the specialties of dentistry and a master's degree in dental hygiene are offered. Clinics, open to the public, are conducted in all areas of dentistry and the Hospital Dental Service is staffed and maintained by the School.

William Black Medical Research Building

The newest addition to the Columbia-Presbyterian Medical Center is the 20-story William Black Medical Research Building at 168th Street and Fort Washington Avenue. The building is now used exclusively for research with all departments of P&S expanding their present quarters. The building, dedicated January 3, 1966, was named for William Black, founder and Chairman of the Board of the Chock Full o' Nuts Corp. The financing of the building was made possible in part by a \$5,000,000 gift from Mr. Black to P&S.

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital in the City of New York is the corporate title for all the voluntary hospitals and clinics at The Columbia-Presbyterian Medical Center. Some 140,000 patients a year are cared for in the hospitals, clinics, and doctors' offices of the Medical Center. The group consists of the following units:

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison and Park Avenues between 70th and 71st Streets. On April 25, 1911, Presbyterian Hospital made its original arrangement with Columbia University's College of Physicians and Surgeons for coordinating the care of the sick with the educational and research program of the University. Now Presbyterian Hospital is the largest single unit of the Medical Center. The Hospital occupies a 22-story building in which are the wards of the Medical and Surgical Services, Obstetrical and Gynecological Service, Urological Service, Ear, Nose and Throat Service, Dermatological Service and the Orthopedic Surgery Service.

Babies Hospital

Babies Hospital, 167th Street and Broadway, founded in 1887, provides for general medical and surgical care of infants and children up to their thirteenth birthday, and care for premature babies. The total capacity of the Hospital is 198. One floor is devoted to the care of private and semi-private patients. Both outdoor and indoor playrooms are provided for convalescent children. Laboratories are operated for the diagnostic and research work of the Hospital in pathology, microbiology and chemistry. An X-ray and fluoroscopic department is operated under the direction of the Hospital radiologist. An outpatient department is maintained in Vanderbilt Clinic by the attending and house staff of the Hospital. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

Under construction is a new 14 story addition to provide modern patient areas, laboratories, classrooms and special care units. The new addition will permit complete modernization of the older building.

The Dana W. Atchley Pavilion

This new highrise building, located at the corners of Fort Washington Avenue and 165th Street provides a modern facility for ambulatory-patient care. Here 175 physicians see their private patients, by appointment, for part of each day, and are close to the Hospital and College to fulfill their teaching duties and to serve in the wards and clinics.

Harkness Pavilion

Harkness Pavilion, 180 Fort Washington Avenue, erected when the Medical Center was established in 1928, is available for the accommodation of 303 adult private patients of the attending staff.

The Mary Harkness Unit

Mary Harkness Unit, King Street, Port Chester, N. Y., opened in 1937 to provide convalescent care for adults. In a beautiful country setting, facilities are available for the extended care of 55 adults.

The Edward S. Harkness Eye Institute

The Institute, located at 635 West 165th Street, opened in 1933, has complete facilities for the medical and surgical treatment of adult and child patients with diseases of the eye. There are private, semi-private and ward beds, with a total capacity of 104. On January 1, 1940, the work of the Herman Knapp Memorial Eye Hospital was taken over by the Institute.

Report of the President

The Presbyterian Hospital in the City of New York



Report of the President of the Presbyterian Hospital for 1969

NINETEEN HUNDRED AND SIXTY-NINE marked the end of a decade of medical progress and discovery that is providing physicians and hospitals with the potentiality of curing, controlling or eradicating a variety of human ills that had seemed hopeless only a few years ago. However, to provide the services required and demanded and because of the inflationary trend throughout the nation's economy, hospital costs and deficits rose to the point where the very existence of many hospitals was threatened.

In 1969, our Hospital had an operating loss of \$6,586,000 for ward and clinic patient care, of which \$4,030,000 was incurred for outpatient services at Vanderbilt Clinic and \$2,556,000 for ward patient services within Presbyterian Hospital. The Hospital's net deficit, after applying income from contributions, investments and other sources, totalled \$3,581,258, highest in its 101-year history.

During 1969, 38,500 patients were admitted to the Hospital for a total of 456,800 days of care, of which 208,800 days were for ward patients. There was a total of 618,577 outpatient visits to Vanderbilt Clinic and Doctors' Private Offices, of which 36,944 Clinic visits were free. Hospital operating costs increased by \$9,528,146, compared with 1968, to a new high of \$63,356,381, of which \$44,106,374 was for payroll and employee fringe benefits. The personnel roster rose by 221, to a total of 4,996.

All of the facilities at Presbyterian Hospital have been utilized at a consistently high level throughout the decade, with very little variation in the total number of patients seen from year to year. However, as medical knowledge has continued to advance, the number of diagnostic and treatment services required for each patient has also increased as have the costs for providing such services.

We at Presbyterian are extremely proud of our organization and we have tried to keep our salaries and wages reasonably competitive; to accomplish this two major increases besides many merit increases were given in 1969. Retirement and other fringe benefits have also been improved.

A general salary increase affects overall hospital costs dramatically. Hospitals must function around the clock, including weekends and holidays, for a total of 8,760 operating hours a year. Most businesses work an average of only 2,000 hours a year, and when extra shifts are added, production and income usually go up proportionately. Hospital income depends upon the number of beds in service, and costs to patients are determined by the number of services provided for them. The average cost of inpatient care at Presbyterian Hospital has increased from \$39.47 a day in 1960 to \$100.68 in 1969; and outpatient care at Vanderbilt Clinic has increased from \$7.62 a visit in 1960 to \$24.11 in 1969.

Medicare and Medicaid programs, inaugurated in 1966 and 1967, began to provide financial assistance to thousands of patients who had previously been treated free, or for only a fraction of actual costs. However, when costs for the Medicaid program began to rise high above estimates, the State of New York froze its rates for Medicaid patients and then changed the basic income requirements of those who might qualify for Medicaid assistance. As a result, many Medicaid patients treated at the Hospital were no longer eligible for financial assistance, and thousands more had medical needs that cost far more than Medicaid provided.

We continued to seek new ways to improve efficiency throughout the Hospital. Automatic data processing applications to fiscal, administrative, pa-

tient-care and research endeavors have been expanded. A computer based on-line information system which maintains inpatient administrative data was introduced at Babies Hospital in 1969 and will be extended to other services. Two automated laboratory systems provide computer generated reports for patients' charts. Plans are currently underway to expand the automated laboratory system, and to use the computer to handle outpatient data.

We are pleased to report that the School of Practical Nursing, which opened in 1968, graduated its first class in 1969, and most of the graduates have elected to continue their nursing careers at Presbyterian Hospital. This is also true of graduates of the School of Operating Room Technology, which recently graduated its first class. The new School of X-Ray Technology admitted its first class in 1969, and its graduates are expected to provide the Hospital with needed well-trained X-ray technicians in the years ahead.

Most of the major goals of the Columbia-Presbyterian Medical Center Development Program, set in 1960, had been reached by the end of 1969, at which time \$53,000,000 had been spent for projects that were in service. Projects completed and put in service during 1969 were: A new, enlarged *Cardiac Monitoring Unit*; a new *Central Diagnostic Unit* at Neurological Institute; enlarged *Parking Facilities for Employees and Visitors*; and the *Addition to The Edward S. Harkness Eye Institute*.

Projects in various stages of planning and construction at the close of 1969 were: *Babies Hospital Addition*; *Reconstruction of Presbyterian Hospital's Fourth Floor*; a new enlarged *Cardiac Catheterization Unit*; an enlarged *Central Sterile Supply Unit*; new *Emergency Facilities at Vanderbilt Clinic*; a *Surgical Intensive Care Unit*; *Central Laboratory Facilities*; and new, enlarged *X-Ray Facilities at Presbyterian and Babies Hospitals*.

Late in 1969, it was realized that funds to carry out the Presbyterian Hospital Development Program — announced late in 1968 — were not coming in as anticipated. The new tax bill under consideration by Congress had become of deep concern to philanthropic foundations and individuals, many of which were reluctant to commit funds until they knew exactly how their tax situation would be altered. We are hopeful that all of the stated goals can be achieved, but certain construction is now at a halt

and other projects are being held up until adequate funds become available. Among the most urgently needed facilities are the addition to Babies Hospital and new Emergency Facilities at Vanderbilt Clinic, construction of which began in 1969. Every effort is currently being made to raise the \$25,000,000 still needed to complete the financing of these high-priority projects.

The Presbyterian Hospital feels a deep responsibility to the Washington Heights Community, where a majority of its patients live. Meetings have been held with community groups in an effort to keep them informed of Hospital programs.

We are pleased to announce the election to the Board of Trustees of Mr. George S. Dillon, President and Chief Executive Officer of Air Reduction Company, Inc., whose broad business experience and special knowledge of hospital problems uniquely qualify him to serve as Trustee.

With deep sadness, we report the death of two ~~other~~ devoted and loyal friends of Presbyterian Hospital, Mr. Henry C. Alexander, Mr. John W. Hornor and Mr. Sidney J. Weinberg, who had served the Hospital as Trustees for many years, and whose wisdom and knowledge of Hospital problems were of invaluable assistance.

With equal sadness, we report the deaths of six distinguished physicians whose work at Presbyterian Hospital was recognized throughout the medical world, reflecting great credit upon this institution. They were Drs. Jean Corwin, Harrison L. McLaughlin, Hilary H. Holmes, Rudolph N. Schullinger, Thomas J. Sullivan, and William von Lackum.

We extend our sincere thanks and appreciation to the professional staff, and all personnel for their loyalty and dedication to the ideals of our great hospital. A special word of thanks must go to the members of the Auxiliaries and the Volunteers who serve so faithfully. We are also grateful to Columbia University for its cooperation and to all who support the humanitarian work of the Hospital with their gifts.



AUGUSTUS C. LONG
President

April 1, 1970



Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

As has been the case in recent years, this year the Medical Board has spent much of its time in planning new and improved facilities for patient care. Plans for the new Emergency Room area have been drawn up, reviewed by all of the concerned departments, modified and finally agreed upon. Construction work has begun and we look forward to having one of the best emergency receiving areas in the country. A careful study and reappraisal of the entire Vanderbilt Clinic and its many functions has been started. When this is completed we anticipate a great improvement in the efficiency with which we manage the less acutely ill patients who crowd into our admitting facilities at all hours of the day and night. In addition to improving things on the ground floor plans are being made to simplify and "streamline" the many clinics on the upper floors. An appointment system has been instituted in several clinics and plans are being made to extend the system to other clinics as soon as feasible. All of this it is hoped will make visits to Vanderbilt Clinic pleasanter as well as more effective than ever before for the 90,000 emergency patients and the 400,000 non-emergency patients who visit the clinic annually.

The new wing on the Edward S. Harkness Institute for Ophthalmology has been opened. It provides both research and clinic facilities. Moving the Eye Clinic into the new building has helped create much needed space for the enlargement of the emergency facilities mentioned above.

Another much needed facility has been opened this year and that is the Coronary Care Unit which occupies space which was previously one of the medical wards. In this unit the most modern equipment for the care of very sick cardiac patients has been provided. It has already proved its worth by being instrumental in saving many lives.

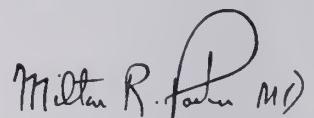
After considerable study by the administration and staff it was agreed that the new centralized clinical laboratories would be placed in an area in the new wing of Babies Hospital. It is believed that when completed these laboratories will provide more efficient, faster and better service to the patients.

The appointment of Doctor Douglas Damrosch as "Director of the Medical Center" with the mission of studying and finding solutions to problems in the zone where the hospital and college responsibilities overlap promises to help each institution and to make the center as a whole an even better place for teaching, research and patient care than it has been.

One of the disturbing problems encountered by the hospital administration and staff during the year has been our failure to get the various governments (city and state) which are involved to pay for the care of indigent patients in accordance with the new health legislation. Frequent conferences with government representatives have been and will continue to be held until the problems are solved.

A committee has been appointed by the Medical Board to advise the staff regarding the management of narcotics addiction which is a most serious problem in the city.

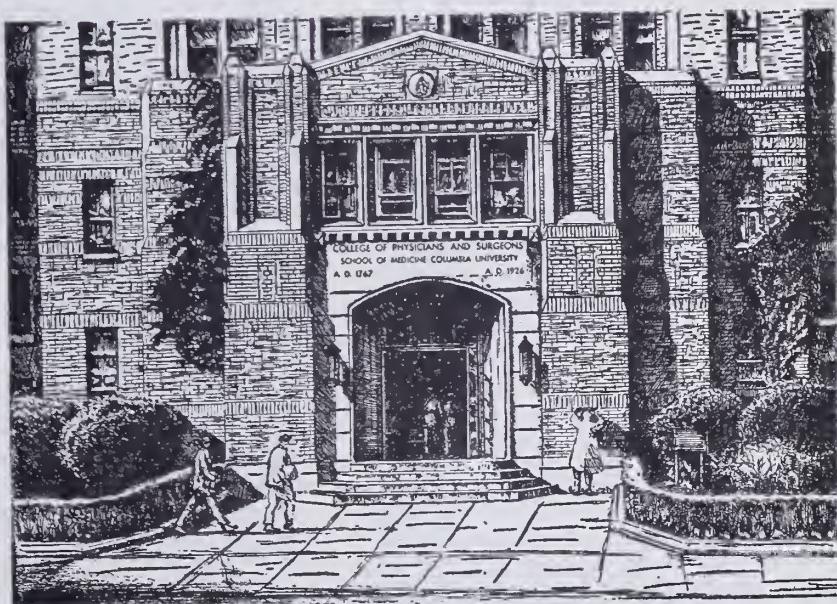
Advances in medical knowledge, made possible by research at the Medical Center, continue to result in improved clinical applications on most services throughout the Hospital.



MILTON R. PORTER, M.D.
President of the Medical Board

Report of the Dean
of the Faculty of Medicine

College of Physicians and Surgeons
Columbia University in the City of New York



Report of the Dean of the Faculty of Medicine

The new curriculum discussed in the last report was initiated in September, 1969. It was found that it would not be possible to start this program for the first year students only but that some modifications were necessary in the schedule for all four years. To date, only minor difficulties have been encountered. This is probably due to the fact that many conferences have been held involving the Curriculum Committee, the instructional faculty and the students.

Two changes in operational procedures have been approved by the faculty at the request of the students. Any student who fails in one year's work will be permitted to repeat that year. Students in the first year will not be given a numerical grade. The transcript will record only pass or fail. It is too soon to determine the value of these changes and it is quite possible that with further experience, modifications will be made.

The relationship of the school to the community and the role of the school in developing more efficient patterns of medical care have been of concern to the faculty and students. A Student-Faculty Community Relations Committee has been established and they are actively concerned with these problems. Dr. George I. Lythcott has been appointed Associate Dean. He will have the overall direction of the programs related to the community, particularly our affiliation with the Harlem Hospital and its role in the medical care of the Harlem community. He is also responsible for the activities of our school in the Regional Medical Programs. Dr. Lythcott received his M.D. degree from Boston University and is certified by the American Board of Pediatrics. Before coming to Columbia he directed the immunization program in Nigeria under the Communicable Disease Center of the United States Public Health Service.

It is probably unnecessary to report that Colum-

bia University is experiencing the same financial difficulties as all universities as a result of the spiraling inflation and the reduction of the budget of the National Institutes of Health. It is fair to say that our school has not suffered as severely as many others. Our educational activities have continued to expand and we have not as yet had a serious reduction in our research grants.

There have been three significant developments in the past year. The establishment of a Department of Human Genetics and Development with Dr. Paul A. Marks as Chairman will add greatly to our educational and research opportunities in this field. Dr. Sol Spiegelman, formerly of the University of Illinois, has been appointed Director of the Institute of Cancer Research and Professor of Genetics. His work on viruses and their relationship to cancer will greatly expand the activities of our school directed toward the conquest of this grave disease. A program in the training of medical scientists has been started under the direction of Dr. Brian F. Hoffman. This program, financed by the National Institutes of Health, will permit the training of a limited number of students for careers in teaching and research.

This is the last report that I will be giving as Dean and it would, therefore, seem worthwhile to summarize the developments of the past ten years and to discuss briefly some of the needs of the schools which have not been met.

The past ten years have been characterized by an expansion of enrollment of medical schools and a phenomenal growth in their research activities. Our school has shared in both of these.

The number of students in our first year class has been increased from 120 in 1959 to 138 in 1969.

Grants for research from the government, foundations, lay health organizations, industry and philanthropic individuals have increased four-fold from a level of approximately six million to more than

twenty-five million annually. With the recent restriction in the budgets of the Federal Government, there will be a decrease in the revenue from this source entailing a reduction in research activities unless funds can be obtained from other sources.

There has also been a substantial increase in the funds available for general purposes. The endowment of the medical school has more than doubled from a level of twenty-four million in 1959 to more than fifty-seven million in 1969. Endowment funds available for scholarships have risen from slightly less than one million dollars to more than two and one-half million in the same period.

A considerable portion of the increase in endowment for general purposes was in the category of endowed professorships. In 1959 there were two endowed professorships, as compared to seventeen in 1969.

In addition to the above, financial aid for educational purposes in the amount of approximately one-half a million dollars annually has been obtained by grants from the Federal Government and the State of New York. Both of these grants were based on an increase in enrollment in the school. Also gifts have been received from the Richard King Mellon Charitable Trusts and the Procter and Gamble Fund of over one hundred and fifteen thousand dollars annually.

Our physical facilities have been improved by the remodeling of the class rooms and laboratories at a cost of over two million dollars. This was made possible by gifts from Mr. Charles Lachman and other friends of the school and by a matching grant from the National Institutes of Health.

The Alumni Auditorium was built by gifts from Alumni and their friends and the William Black Research Building added approximately 200,000 square feet of research space. The construction of the research building was made possible by the generous gift of five million dollars by Mr. William Black, and by large and small gifts from many other friends of the school and by a grant from the National Institutes of Health.

Much of the increase in the funds which came to the school in the past ten years is due to the success of the fifty million dollar campaign of the Columbia-Presbyterian Medical Center. This campaign went considerably above its goal and was responsible not only for the improvements in the school but also for the addition of new facilities in the Presbyterian Hospital, including the new Service Building, the research wing of the Institute of Ophthalmology, the Atchley Pavilion for doctors' private practice offices and other improvements.

It is a sad commentary that with all of the additions to our endowment and other funds for general purposes, the school has not been able to improve its financial position and is forced to call on university funds to a much greater extent than in former years. This is due to an increase in the size of the faculty and a rise in the level of salaries paid to the faculty and supporting staff and to the cost of the upkeep of the old and new facilities.

The general spirit of change in colleges has had an effect on our school. The curriculum has been completely revised. The faculty has been reorganized and the students are playing a significant role in the governance of the school.

With all of the prosperity of the past decades we have not been able to accomplish all our aims. Construction of the new library has been delayed. A suitable site for this facility has been obtained but due to restriction of funds by the Federal Government, construction has not started as yet. For the same reasons the erection of the building for the International Institute for the Study of Human Reproduction and the new Dental School has been delayed.

In summary, the past ten years have been marked by much progress but there remains much to be done.

A brief resume of the teaching, research and clinical activities of the school is given in the reports of the various departments.

The registration of the School of Medicine in September, 1969 was as follows:

First Year	138
Second Year	131
Third Year	129
Fourth Year	117
	515

The Committee on Admissions reported total applications of 1,642. Interviews were requested of approximately one-third and 133 were selected for admission. The entering class came from sixty-four different colleges and twenty-eight states. Fifteen were women and eight were children of alumni.

The Committee on Admissions, assisted by concerned student groups, sought particularly for more students from minority groups and for those of good potential whose records reflected lack of opportunity or environment rather than basic ability. It is pleased to report a four-fold increase in applications from such groups and a significant increase in the number of acceptances.

Once again, as judged by personal qualifications,

motivation and prior performance, a class of unusual quality and excellence has entered the school.

In The School of Public Health and Administrative Medicine the registration in September, 1969 was as follows:

D.P.H. candidates	9
M.P.H. candidates	37
M.S. candidates	101
Special Students	25

In the Department of Nursing the registration in September, 1969 was as follows:

First Year	111
Second Year	112

In the Course for Occupational Therapists, fifty-one students were registered in September, 1969. Forty-seven students were registered for the Course for Physical Therapists.

The following degrees were awarded:

M.D.	121
M.P.H.	39
M.S. (Radiologic Physics, Nursing and Public Health fields)	77
B.S. (Nursing, Occupational Therapy, Physical Therapy)	128

It is with the greatest sorrow that we report the following deaths during the year:

Alexander E. W. Ada, Associate Clinical Professor of Surgery retired, on February 28, 1969

Sue Buckingham, Assistant Professor of Pediatrics and Assistant Attending Pediatrician, Presbyterian Hospital, on January 22, 1969

Magnus I. Gregersen, Dalton Professor of Physiology, on August 26, 1969

Eric R. Osterberg, Assistant Professor of Public Health Practice, on April 27, 1969

Rudolph N. Schullinger, Professor Emeritus of Clinical Surgery and Consultant, Presbyterian Hospital, on June 27, 1969

Thomas J. Sullivan, Associate Professor of Clinical Urology and Associate Attending Urologist, Presbyterian Hospital, on December 15, 1969

William H. von Lackum, Assistant Clinical Professor of Orthopedic Surgery and Associate Attending Orthopedic Surgeon, Presbyterian Hospital, retired, on August 26, 1969

I. Ogden Woodruff, Professor Emeritus of Clinical Medicinc, on May 26, 1969

The following retirements during the year are reported:

Frederick H. Amendola, Clinical Professor of Surgery (Roosevelt Hospital)

Alice T. Baker, Instructor in Medicine and Assistant Physician, Presbyterian Hospital

J. Vincent Flack, Assistant Clinical Professor of Ophthalmology and Associate Attending Ophthalmologist, Presbyterian Hospital

Paul F. A. Hoefer, Professor of Neurology and Attending Neurologist, Presbyterian Hospital

George H. Humphreys II, Valentine Mott Professor of Surgery, Chairman of Department of Surgery, Attending Surgeon and Director of Surgical Service, Presbyterian Hospital, and Consultant in Surgery at Harlem and Francis Delafield Hospitals

Harold W. Jacox, Professor of Radiology and Attending Radiologist, Presbyterian Hospital

George A. Jervis, Clinical Professor of Psychiatry and Attending Psychiatrist, Presbyterian Hospital

Rollo J. Masselink, Assistant Professor of Clinical Neurology and Attending Neurologist, Presbyterian Hospital

Thomas J. Parks, Assistant in Obstetrics and Gynecology and Assistant Attending Gynecologist, Vanderbilt Clinic

Marjorie Peto, Assistant Professor of Nursing and Assistant Director, Nursing Service, Presbyterian Hospital

William M. Rogers, Associate Professor of Anatomy

Louis Schneider, Attending Physician, Presbyterian Hospital

Gilbert P. Smith, Attending Dental Surgeon and Director of Dental Service, Presbyterian Hospital

Warren M. Sperry, Professor of Biochemistry, assigned to Psychiatry

Sonia Stirt, Associate Attending Psychiatrist, Vanderbilt Clinic

Alvin J. B. Tillman, Associate Professor of Clinical Obstetrics and Gynecology and Associate Attending Obstetrician and Gynecologist, Presbyterian Hospital

James E. Thompson, Clinical Professor of Surgery (Roosevelt Hospital)

The following emeritus designations, effective July 1, 1969, were made by the Trustees:

Paul F. A. Hoefer, Professor Emeritus of Neurology and Consultant, Presbyterian Hospital

George H. Humphreys II, Valentine Mott Professor Emeritus of Surgery and Consultant, Presbyterian Hospital

Harold W. Jacox, Professor Emeritus of Radiology and Consultant, Presbyterian Hospital

Warren M. Sperry, Professor Emeritus of Biochemistry

Maynard Wheeler, Clinical Professor Emeritus of Ophthalmology and Consultant, Presbyterian Hospital

The following designations were made during the year:

Frederic P. Herter, Acting Chairman of the Department of Surgery

Paul A. Marks, Professor of Genetics and Chairman of the Department of Human Genetics and Development

Milton C. Maloney, Acting Chairman of the Department of Public Health and Administrative Medicine and Acting Assistant Dean (Public Health)

Shih-hsun Ngai, Acting Chairman of the Department of Anesthesiology
 George K. Smelser, Malcolm P. Aldrich Professor of Anatomy
 David Sprinson, Acting Chairman of the Department of Biochemistry
 John V. Taggart, John C. Dalton Professor of Physiology

The following promotions were made during the year:

Karlis Adamsons, Jr., Professor of Obstetrics and Gynecology
 Herbert J. Bartelstone, Professor of Pharmacology
 Shu Chien, Professor of Physiology
 Charles L. Christian, Professor of Medicine
 Irwin Clark, Professor of Biochemistry, assigned to Orthopedic Surgery
 Douglas S. Damrosch, Associate Dean
 Elinor F. Downs, Associate Professor of Public Health Practice
 Roger C. Duvoisin, Associate Professor of Neurology
 Ann M. Earle, Associate Professor of Nursing
 Max A. Eisenberg, Professor of Biochemistry
 S. Raymond Gambino, Professor of Pathology
 Arnold P. Gold, Associate Professor of Clinical Neurology, assigned to Pediatrics
 DeWitt I. Goodman, Professor of Medicine
 S. Ashby Grantham, Associate Professor of Clinical Orthopedic Surgery
 William Gross, Associate Professor of Radiology (Physics)
 Frank E. Gump, Associate Professor of Surgery
 Donald H. Harter, Associate Professor of Neurology, assigned to Microbiology
 Sadek Hilal, Professor of Radiology
 A. Walter Hoover, Associate Professor of Occupational Medicine
 Robert M. Hui, Professor of Clinical Otolaryngology
 Konrad C. Hsu, Professor of Microbiology
 Gerard A. Kaiser, Associate Professor of Surgery
 Joannes H. Karis, Associate Professor of Anesthesiology
 Arthur Karlin, Associate Professor of Physiology, assigned to Neurology
 Mavis A. Kaufman, Associate Professor of Neuropathology
 Donald S. Kornfeld, Associate Professor of Clinical Psychiatry
 Robert E. Lovelace, Associate Professor of Neurology
 Equinn W. Munnell, Clinical Professor of Obstetrics and Gynecology
 Sidney Malitz, Professor of Clinical Psychiatry
 Hymie L. Nossel, Associate Professor of Medicine
 Richard W. Patterson, Associate Professor of Anesthesiology
 Guy D. Potter, Associate Professor of Radiology
 Robin M. Rankow, Associate Professor of Otolaryngology

Herbert Rosenkranz, Professor of Microbiology
 Jacques Rutschmann, Associate Professor of Medical Psychology
 David Schachter, Professor of Physiology
 Katherine Sprunt, Associate Professor of Pediatrics
 Charles M. Steer, Professor of Clinical Obstetrics and Gynecology
 Stuart F. Sullivan, Associate Professor of Anesthesiology
 Patricia K. Tretter, Associate Professor of Clinical Radiology
 Arthur R. Wertheim, Professor of Medicine
 Susan W. Williamson, Associate Professor of Clinical Obstetrics and Gynecology
 Robert H. Wylie, Professor of Clinical Surgery

The following new appointments were made during the year:

Kimball C. Atwood, Professor of Human Genetics and Development
 Arne C. V. Barkhuus, Professor of Public Health Practice
 Elizabeth Connell, Associate Professor of Obstetrics and Gynecology
 Charles E. Huckaba, Professor of Rehabilitation Medicine
 Albrecht M. Kellerer, Associate Professor of Radiology (Physics)
 Thomas S. Langer, Professor of Epidemiology
 George I. Lythcott, Associate Dean and Associate Professor of Administrative Medicine
 Sol Spiegelman, Professor of Genetics and Director of Institute of Cancer Research

The Janeway Prize, awarded to the graduate who, in the opinion of the Faculty, has ranked highest in efficiency and ability was given to Dorothy A. Rollefson. The Borden Undergraduate Research Award was given to Neil W. Kavey for outstanding research work during the medical course. Eve E. Slater received the Frederick P. Gay Memorial Award.

The Joseph Mather Smith Prize, awarded to the graduate whose essay or original research in medical subjects is deemed by the Committee on Awards to be the most meritorious was given to Philip E. Duffy, Class of 1947. The William Perry Watson Prize in Pediatrics was given to Dorothy A. Rollefson. The Harold Lee Meierhof Memorial Prize in Pathology and the Roche Award were given to George M. Lazarus. The Helen M. Sciarra Prize in Neurology was given to Laurance J. Guido.

The Joseph Garrison Parker Award was given to Jerome A. Liebowitz. The Walter Winchester Prize was awarded to Glenda J. Garvey. The Alumni Association Senior Student Award was given to Leland G. Dobbs. Geoffrey P. Redmond and Susan Sternbach were given the Medical Stu-

dents' Thesis Award in Psychiatry. William S. Abernathy, Jeffrey R. Fisher and Walter H. Stingle were awarded the Urology Prize. Malcolm M. Brown, Joel A. Budin and John W. Harmon received the Merck Manual Award. The Alvin Behrens Memorial Prize in Ophthalmology was given to William E. Benson.

The Graduate and Postgraduate Programs

The graduate and postgraduate programs continue to enlarge both in number of students and courses offered. In part this reflects the growing interest in continuing education for physicians throughout the country.

During the past year 449 residents and 42 interns received part or all of their training under the direction of faculty members. In addition there were 492 trainees and fellows, as well as 162 visiting fellows from the United States and foreign countries.

Student and Personnel Health Service

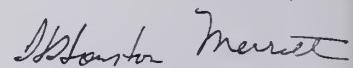
The Student Health Service has remained under the direction of Dr. Albert R. Lamb, Jr.

During the past academic year 2,440 patient visits were made to this office, compared with 2,148

the preceding year. In addition, routine physical examinations totaling 422 were performed on all the new students, and on third year students in medicine and dentistry and routine chest x-rays were obtained on the student body. There were slightly more than 1,000 visits to the Vanderbilt Clinic made by the students.

The Personnel Health Service remained under the direction of Dr. Kirby Cunningham. During the year 463 patient visits were made, compared with 503 the previous year. In addition, 413 physical examinations were performed; pre-employment 238 and radiation safety 175.

A variety of other services were provided. These have included a wide range of immunization, completion of health reports, premarital examinations and insurance forms and advice and counsel on a great variety of subjects.



H. HOUSTON MERRITT, M.D.

Dean of the Faculty of Medicine

December 31, 1969

Reports of Departments
and Services

Anatomy

EDWARD W. DEMPSEY

Professor and Chairman of the Department

The past year has been difficult. Frustrating events have sapped energies and seriously compromised effectiveness. Student and faculty unrest has disrupted orderly procedures, often causing preoccupation with events beyond our competence or ability. Protests against the Vietnam War and the days of Moratorium have still further reduced the time spent on an already shortened schedule. The curriculum which went into effect this year has required completely new designs for all of our courses. Exercises have had to be repeated for a second section and because of inadequate teaching space electives have had to be scheduled regardless of conflicts with other courses. Reductions in research and training grants have hampered our programs and have contributed to the general feeling of unease. Issues involving restructuring the organization of the Medical School, particularly as concerns a periodic review of departments and their Chairmen, has divided our faculty into polarized groups. All of these situations and events have militated against an orderly and tranquil pursuit of customary academic activities.

Teaching Activities

Notwithstanding the difficulties enumerated above, we have made some continued progress in the directions indicated in last year's report. These concern developments in cell biology, presentation of modern knowledge of ultrastructure and use of programmatic teaching by automated devices. Sound-

films, sound-slides, automatic projection and closed circuit television all play their parts and effectively enrich the contents of our courses by making available larger amounts of information than can be presented in the usual lecture-laboratory system. With the core curriculum now in effect, we have shortened or eliminated many previous exercises. For example, much of our previous attention to embryology has been eliminated since this subject is now within the scope of the new Department of Human Genetics and Development. However, our newly designed courses are not simply shortened versions of the previous ones. Increased numbers of demonstrations are important adjuncts; greatly expanded presentations of electron micrographs with pictures, lantern-slides and lectures have provided opportunities for teaching cytology. The use of automated aids such as films, slides and television have given us new means to teach students accustomed to obtain information from projected images.

In addition to courses in microscopic anatomy, gross dissection and in neurological sciences, all for medical and dental students, the department is responsible for instructing students in nursing and in occupational and physical therapy. We give courses providing credit for candidates for advanced degrees awarded by the Graduate Faculties. Through the School for General Studies we provide night courses in human anatomy and neuroanatomy, and in the Summer Session there are courses in systematic human anatomy and in microscopic anatomy.

Finally, we provide space, material and often instruction for numerous postgraduate courses designed for residents on the one hand and practicing physicians on the other. Needless to say, the time and energy required to redesign and execute the basic courses in the core curriculum for medical and dental students have occupied the staff fully. It has not been possible to change or to improve our other offerings except incidentally as the new material has become available. Plans for expanding elective courses have necessarily been shelved this year, despite the fact that they are needed badly both for medical and graduate students. The need for the graduate students is particularly acute, since the core courses are no longer adequate for graduate education, and since our training programs, dependent upon training grants, have been unavoidably weakened.

Fortunately in this time of troubles, our teaching staff has been strengthened. Drs. Richard P. Bunge and Philip W. Brandt, both on sabbatical leave last year, have returned and are again active in our teaching program. As additions to the staff, Drs. Ray Henrikson and Ernest April have joined us as Assistant Professor and Instructor, respectively. Drs. Jennifer Jarvis, Visiting Instructor, and Eva Cramer, Research Fellow, also share in our teaching exercises.

Research Activities

As in other areas, research has suffered because of the disturbing events of the year. Nevertheless, by redoubled efforts our investigations have been continued and in some instances even expanded. Research and training in electron microscopy has proceeded along a broad front. We have underway studies on the placenta, the nervous system, the kidney and many other fetal and adult organs. Our studies range widely in experimental fields being concerned with intracellular sites of drug action, localization of silver deposits in experimental argyria, pathological changes induced by experimental means, the use of tissue culture techniques, sperm capacitation and decapacitation, immunological actions of endocrine substances, the mechanics of bones and joints, phylogenetic patterns of locomotion, biophysics of membrane systems and many other subjects. We have expanded our ultra-structural capabilities during the year by purchasing a Cambridge Instrument Company Stereoscan electron microscope, and we are undertaking jointly with members of the Departments of Obstetrics and Gynecology and Pediatrics a study of the composi-

tion of amniotic fluid. Other collaborative studies include those of Dr. Frederick J. Agate, Jr. with members of the Department of Surgery on burns, work on leprosy bacilli grown in tissue culture by Dr. Cecelia Fildes, working jointly with facilities in the Departments of Anatomy, Microbiology and Surgery, Dr. Brandt's studies of membranes with Dr. Harry Grundfest (Neurology) and Dr. J. Michael Bedford's investigations on male reproduction carried out with support from the International Institute for the Study of Human Reproduction.

Our research and research training programs in gross microscopic and developmental anatomy, in neuroanatomy and in dental anatomy have been continued throughout the year. Predoctoral candidates for the Ph.D. degree in anatomy included Pamela Binnicker, Constance Cardasis, James Colgan, Ann Jones, Mary Lee, Jocelyn Prendergast, Ernest April and Dr. Ottheinrich Hase. Of these, Hase and April received their degrees in June, Prendergast resigned from the program for personal reasons and the rest remain in training. Dr. Robert Howes is also a predoctoral trainee in the dental anatomy program. As postdoctoral trainees directly attached to our programs, Drs. Eva Cramer, Judith Koehler, Philip Peter, John Harting, Peter Carmel and Rosemary Green are currently in residence. Drs. Ina J. Wundrum and Linda Saland completed their training during the year. In addition to these we have provided supervision, facilities, support or guest privileges for Drs. M. Tolar (Surgery), C. Fildes (Surgery), Ljiljana Zergollern (Pediatrics, Zagreb), Lennart Nicander (Anatomy, Stockholm), Robert Jack (Ophthalmology), Tom Weingeist (Ophthalmology), Jacqueline Bartmann (Pediatric Pathology), Prem Chauhan (Pediatric Pathology), Henry Fremont (Preventive Medicine), Louis Miller (Preventive Medicine), Ming Dan (Physiology), William Orr (Pathology), Robert Waldron (Radiology), Peter Carmel (Neurosurgery), and Ronald Brisman (Neurosurgery). We have also provided training in research for several medical students, including Richard Tindall, Robert Lessey, James Cinberg and Peter Friedman from this institution and, from elsewhere, Carol Gianelli (St. Louis University), William Blank (St. Louis University), Robert Richter (Tulane), Hugh West (Washington University), and Andrew Marsden (University of London).

Extensive research and training activities are carried on in physical locations outside the department by members assigned elsewhere. These are Drs. George Smelser, assigned to Ophthalmology, Mary S. Parshley, assigned of Obstetrics and Gynecology,

Fred Mettler, assigned to Neurology and Margaret Murray, assigned to Surgery. Details of their activities are evident from the attached bibliography and from our interlocking training activities noted in the preceding paragraphs.

Extradepartmental Activities

As in all other activities, participation in national and international affairs has been hampered by the demands of local events. Nevertheless, participation in extramural programs which reflect credit to our University have not been fruitless. Dr. Bedford has made invitational appearances at The Worcester Foundation, the Peter Bent Brigham Hospital, The American Society for the Study of Reproduction and at the IIIrd Biosciences Symposium at Berlin, West Germany. Dr. Brandt returned from his sabbatical leave in Copenhagen, spent the summer at the Woods Hole Marine Biological Laboratory and returned to New York in September. Drs. Richard P. Bunge and Mary Bunge spent a sabbatical leave in the Department of Neurobiology at Harvard and while there participated in an International Symposium on Neuroglia in London. During the summer they participated in the Neurosciences Study Program at Boulder, Colorado, after which they returned to New York in September. Dr. W. Patrick Luckett was enabled to study the embryo collection at the Hubrecht Laboratory in Utrecht by receipt of a Lalor Foundation Fellowship. Dr. Melvin L. Moss addressed the European Orthodontic Society in Edinburgh and Dr. Letty Salentijn travelled to Utrecht in connection with arrangements to defend a doctoral thesis there. Dr. Sarah Luse visited the University of Helsinki to obtain material for a collaborative electron microscopic study of the human fetus. She also participated in an International Conference on High Voltage Electron Microscopy at Monroeville, Pennsylvania, and at a symposium on Scanning Microscopy at Chicago, Illinois. Dr. Edward W. Dempsey also attended the latter conferences, as well as a symposium on Comparative Pharmacology at Gaithersburg, Maryland. In addition, he visited several laboratories in Scandinavia and in England in connection with programs sponsored by the Association for the Aid of Crippled Children and by the National Institute of General Medical Sciences.

Members of the department serve as editors for various professional journals. Dr. Malcolm B. Carpenter serves on the editorial board of *Neurology* and the *American Journal of Anatomy*. Dr. Herbert Elftman's name is on the *Artificial Limbs* and

the *Journal of Biomechanics*. Dr. George K. Smelser serves on the Boards of *Investigative Ophthalmology* and *Experimental Eye Research*. Dr. J. Michael Bedford is an associate editor of *Biology of Reproduction*. Dr. Charles R. Noback is co-editor of *Advances in Primatology*. Dr. Dempsey is an associate editor for *Experimental Neurology* and the *Journal of Histochemistry and Cytochemistry*. Drs. Carpenter and Dempsey are also advisors to the Columbia University Press.

The department provides advice and consultation for many societies and agencies. Dr. Elftman is a member of the Executive Committee of the American Association of Anatomists. Drs. Carpenter and Richard Bunge are members of the Neurology A and B Study Sections of the National Institutes of Health, respectively. Dr. Smelser is a member of the Vision Research Training Committee of the National Institutes of Health and a Trustee of the Association for Research in Ophthalmology. Dr. Luse serves on the Anatomy and Pathology Fellowships Review Committee of the National Institutes of Health. Dr. Carpenter is a member of the Advisory Board of the Parkinson Disease Foundation. Dr. Brandt is a Career Research Development Awardee and also a Guggenheim Fellow. Dr. Dempsey serves on the National Advisory General Medical Sciences Council and is liaison member of the Regional Medical Programs Council, both of the United States Public Health Service. He also serves on the Scientific Advisory Panel of Research to Prevent Blindness and the Jury of the Lasker Foundation. He is a staff Associate for the Association for the Aid of Crippled Children and Consultant on Cell Biology for the National Institute of General Medical Sciences.

Acknowledgments

The research carried on in this department has been made possible by funds provided through the generosity of many public and private foundations, agencies, companies and individuals. Support has been received from the American Cancer Society, the Damon Runyon Fund, The Sinsheimer Fund, The Lillia Babbitt Hyde Foundation, the China Medical Board, The National Multiple Sclerosis Society and The Association for the Aid of Crippled Children. The Upjohn Company has made a grant toward research in diabetes. We have received grants from the National Institutes of Neurological Diseases and Stroke, of General Medical Sciences, and of Child Health and Human Development. Funds supporting our work have also come from

Anesthesiology

EMANUEL M. PAPPER

Professor and Chairman of the Department • Director of Service

Dr. Emanuel M. Papper continued to serve as Chairman of the General Medical Sciences Program — Project Committee of the National Institutes of Health, and on the Board of Directors of the American Society of Anesthesiologists. He also continued as civilian consultant in anesthesiology to the United States Air Force and in that capacity visited Wright-Patterson Air Force Base in Dayton and David Grant Hospital at Travis Air Force Base.

Dr. Papper received an honorary degree from the University of Turin. He was Visiting Professor of Anesthesiology at the University of California at Los Angeles and the University of Sydney, New South Wales, Australia. He lectured to the Society of University Surgeons, the West Virginia State Medical Association, the Australian Society of Anesthesiologists in Brisbane, and also at the Universities of Rome, Naples, Catania and Turin, and the All India Institute of Medical Sciences in New Delhi.

Dr. L. Stanley James (Pediatrics-Anesthesiology) participated in the organization of the Second Conference on Experimental Medicine and Surgery in Primates, held in New York City.

Dr. Lester C. Mark continued his work on the Pharmacology-Toxicology Review Committee of the National Institute of General Medical Sciences and the Food and Drug Administration Advisory Committee on Respiratory and Anesthetic Drugs. He was appointed to the editorial board of the *American Journal of Therapeutics* and *Clinical Reports* and to the Professional Advisory Board of the Foundation of Thanatology. He also continued to collaborate with scientists at Brookhaven National Laboratory,

Upton, New York, as Guest Scientist and Visiting Attending Physician.

Dr. Gabriel G. Nahas was appointed Adjunct Professor of Anesthesiology, University of Paris. Together with Dr. Charles L. Fox, Jr. (Surgery), he organized and conducted a symposium on fluid replacement in the surgical patient. He delivered the annual Lilenthal Lecture at Mount Sinai School of Medicine and participated in several international symposia devoted to oxygen transport by inert organic fluids, metabolic changes and control of acid-base balance in shock.

Dr. Shih-hsun Ngai continued to serve on the Committee on Anesthesia, National Academy of Sciences — National Research Council, the editorial board of the journal *Anesthesiology* and the editorial advisory board of the International *Journal of Neuropharmacology*. He participated on the Committee on Scientific Program and was appointed to the Subcommittee on Circulation of the American Society of Anesthesiologists. He was Visiting Professor at the University of Miami, and lectured to the Western Pennsylvania Society of Anesthesiologists.

Dr. Robert M. Epstein concluded his service on the Anesthesiology Training Committee of the National Institute of General Medical Sciences and is now a consultant to the Committee. He served as Chairman of the Committee on Research and on the Committee of Scientific Program of the American Society of Anesthesiologists. He was elected Secretary of the Association of University Anesthetists. He participated in a panel discussion on the safety

of anesthetic equipment during the annual meeting of the American Society of Anesthesiologists. He also served on the visiting faculty of the postgraduate seminar in anesthesiology, jointly sponsored by the Universities of Miami and Florida.

Dr. Ronald L. Katz completed his sabbatical leave as a Guggenheim Fellow at Hammersmith Hospital and Royal Postgraduate Medical School, University of London, working with Professor J. P. Shillingford of the Cardiovascular Research Unit and Professor J. Gordon Robson of the Department of Anaesthetics. He was Visiting Professor at University of Liverpool, Oxford University, Belfast University and the Nijmegen University in the Netherlands. He also delivered lectures to the Royal Society of Medicine (London) and the Anesthetic Research Society of the United Kingdom and visited several universities in Scandinavia.

Dr. Richard J. Kitz returned from sabbatical leave, during which he worked with Professor Bo Holmstedt, Department of Toxicology, Karolinska Institute, Sweden. He resigned in September to take over duties as Anaesthetist-in-Chief at the Massachusetts General Hospital and the Dorr Professorship of Anaesthesia, Harvard Medical School.

Dr. Herman Schwartz started his sabbatical leave in May and worked in the Intensive Care Unit at the Roosevelt Hospital, New York City to gain experience in this important clinical area.

Dr. Daniel M. Philbin won first prize in the 1969 Resident Research Essay Competition sponsored by the American Society of Anesthesiologists. Dr. Lubbos Triner was judged finalist in the Young investigator competition of the American College of Cardiology.

Drs. Ralph A. Epstein, Clyde O. Lord and Eugene Pantuck joined the faculty and attending staff after completion of their federal service. Drs. Dorothy A. Hufnagel, Harry Cohen and Robert T. Donham completed their training and are serving on the attending staff. Drs. Bernard R. Hand, John Savarese and J. Gilbert Stone finished their research traineeship and are now fulfilling their military commitments. Dr. Robert C. E. Lin joined the attending staff at St. Luke's Hospital of New York City. Dr. Michael N. Ashman received a Master of Science (Bioengineering) degree from the Brooklyn Polytechnic Institute and was appointed Assistant Professor of Anesthesiology at the University of Maryland.

The department was honored by visits of many distinguished teachers and scientists during the past year. Dr. John Hedley-Whyte, Associate Professor

of Anaesthesia at Harvard Medical School, and Dr. Russell Van Dyke, Consultant in Anesthesiology at Mayo Clinic, served as Visiting Professors. Lectures were delivered to the staff by: Dr. Ronald A. Andree, Assistant Director, Department of Anesthesiology, Roosevelt Hospital, New York City; Dr. Harry C. Churchill-Davidson, Consultant Anaesthetist, St. Thomas' Hospital, London; Dr. Benjamin G. Covino, Vice President for Scientific Affairs, Astra Pharmaceutical Products, Inc.; Dr. Francis Foldes, Professor of Anesthesiology, Albert Einstein College of Medicine; Dr. Richard M. Goldwyn, Associate Director, Clinical Research Center, Bronx Municipal Hospital Center, Research Staff Associate, IBM Thomas J. Watson Research Center, Yorktown Heights, New York; Dr. Matrin H. Holmdahl, Professor of Anesthesiology, University of Uppsala, Stockholm; Dr. Otto Mayrhofer, Professor of Anesthesiology, University of Vienna; Dr. John F. Nunn, Professor of Anaesthetics, Medical Research Council Clinical Research Centre, Northwick Park, England; Mrs. Mica Wasenius Rie, Physical Therapist, Veterans Administration Hospital, Washington, D. C. and Dr. John H. Siegel, Assistant Professor of Surgery, Albert Einstein College of Medicine.

Teaching

The new third year medical student curriculum has modified the undergraduate teaching program. Throughout the year groups of six to nine students each were given a series of seminar-lectures designed to familiarize them with management of unconscious patients, respiratory and circulatory failure, technics of resuscitation, and actions of potent pharmacologic agents. Bedside teaching is provided in the operating rooms under close supervision of the attending staff. Dr. Charles E. Wolf coordinated the program, which appears to be a worthwhile and interesting educational experience for the students.

The postgraduate teaching program continued to attract capable candidates for clinical and research training. Twenty-three physicians began their residency in July. Ten fellows are receiving research training in the Departments of Anesthesiology, Biochemistry and Pharmacology as well as at Wellcome Research Laboratories. Dr. Carolyn P. Greenberg is studying cardiology under the direction of Dr. M. Irene Ferrer (Medicine). Dr. Nancy McCullough went to the Thoracic Clinic of Karolinska Hospital, Sweden, for a year of advanced training in intensive care under the direction of Professor Olaf Norlander.

The "unit" system of resident teaching continued.

The preceptor-student ratio has been kept at the optimal level of one-to-two, and in certain instances one-to-one. The didactic program, after the previous year of experience with a structured lecture series, has been further extended to cover relevant basic knowledge in depth over a two year period.

Drs. Joannes H. Karis and Ralph A. Epstein have initiated an intensive training program on inhalation therapy and respirator care directed to the residents, nursing staff and paramedical personnel. The shortage of staff in this area throughout the Medical Center warrants continued educational efforts and recruitment.

Patient Care

In 1969, 21,119 patients were attended by the Anesthesiology Service. General anesthesia was administered to 16,900 patients and regional anesthesia to 4,219. 183 patients were seen in consultation for proposed treatment or resuscitation.

The Anesthesiology Service assumed the responsibilities of the Inhalation Therapy Service in July, 1969 with Drs. Karis and Epstein in charge. With the support of a small technical staff and close collaboration of the Rehabilitation Medicine Service a complete range of consultation services is provided in respect to inhalation therapy, chest physiotherapy and long term respiratory support. However, the staff is in need of additional technical personnel and adequate work space to meet the increasing demands for their services. Renovation of the East Ward on the 14th floor of The Presbyterian Hospital for the Surgery-Anesthesiology Intensive Care Unit in the near future should considerably improve the care of critically ill patients, especially those suffering from respiratory failure.

A small anesthesiology pulmonary function laboratory has been established under the supervision of Drs. Stuart F. Sullivan and Richard W. Patterson. This laboratory performs standard pulmonary function tests and blood gas analyses for preoperative evaluation and preparation of surgical patients with significant pulmonary disease, evaluation of the effectiveness of inhalation therapy and operative procedures. Data processing is being facilitated by use of the General Electric Computer Time-Sharing Service with a terminal in the laboratory. The measured and computed values are compared with accepted norms predicted from the patient's sex, age, height and weight. Printouts are available within minutes for the physician's interpretation and for the patient's record.

The clinical blood gas laboratory under the supervision of Dr. Nahas has again increased its service during the past year. Over 8,700 measurements have been performed. Facilities for blood gas analysis are also available in The Presbyterian Hospital recovery room, the delivery rooms and the Neurological Institute operating rooms for immediate patient monitoring.

Technics for fetal monitoring have been expanded to include the use of fetal electrocardiogram through scalp electrode. Initial tests with ultrasonic transducers (developed by Hoffman-La Roche, Inc.) for external monitoring of fetal heart may prove useful for better perinatal care.

A blood pressure monitoring device using ultrasound, developed by the Medical Electronics Division of the Hoffman-La Roche, Inc., has been evaluated by Drs. Paul J. Poppers and Robert M. Epstein and found accurate as compared with intra-arterial measurements. This equipment should be of value in the conduct of hypotensive anesthesia and in the management of patients in shock.

Malignant hyperthermia during and following anesthesia is an unpredictable and usually fatal complication. Early detection and vigorous cooling are essential for successful treatment. Dr. Ryan has developed an effective regimen by using the Wangenstein intragastric hypothermia unit for rapid cooling.

The incidence of emergence delirium and its management has been studied by Dr. Lynne T. Greene. Physostigmine is an effective antidote for scopolamine induced delirium.

Research

Studies on fetal and neonatal physiology and pharmacology continue under the direction of Dr. L. Stanley James. In collaboration with Drs. Hisayo O. Morishima, Harry Cohen and Robert A. Baratz, and Drs. Terusada Horiguchi, Kotaro Suzuki and Karlis Adamsons (Obstetrics and Gynecology), and Dr. Wendell Neiman of the Primate Research Laboratories at Sterling Forest, the effects of ethanol, meta-proterenol (Alupet) and diazoxide on uterine contractions, maternal circulation and fetal acid-base status were investigated in pregnant monkeys with intrauterine catheters and sensors. Dr. Baratz measured the effect of ethanol on maternal plasma antidiuretic hormone as related to its uterine suppressing action. These investigators also examined the relationship between strong uterine contractions and fetal heart rate, acid-base status and hypoxia.

Drs. Morishima, Allen I. Hyman, Adamsons and James have reviewed and established a standard

procedure for anesthesia for intrauterine surgery and postoperative care in monkeys for meaningful physiologic and pharmacologic studies with this experimental model.

Dr. Hyman, together with Drs. Edward T. Bowe, Ross Dixon and Erlio Gurpide (Obstetrics and Gynecology), studied the production and placental transfer of cortisol, estradiol and progesterone in pregnant sheep near term as a part of their investigations on factors relating to the onset and control of labor.

Dr. Poppers, in collaboration with Drs. Benjamin G. Covino and Maximilian Lebeaux of Astra Biological Laboratories, continued to study means of prevention and treatment of methemoglobinemia, a side effect of the local anesthetic prilocaine. The maternal and fetal distribution of lidocaine was examined in pregnant guinea pigs by Drs. Mieczyslaw Finster, Morishima and Drs. Covino and N. Boyes of the Astra Biological Laboratories.

Drs. Poppers and Finster continued their studies on the enzyme induction in fetus by cigarette smoking in collaboration with Dr. James A. Wolff (Pediatrics) and Drs. Allan H. Conney and Richard M. Welch of Wellcome Research Laboratories. The glucuronyl transferase activity was correlated with serum bilirubin concentration and its rate of decline in the neonatal period. Drs. Poppers and Finster are completing their evaluation of the efficacy and safety of chlordiazepoxide (Librium) as a premedicant for mothers in labor.

Dr. Salha Daniel investigated the influence of maternal base deficit on acid-base composition of amniotic fluid and the clinical condition of newborn guinea pigs. She also studied the effect of maternal metabolic acidosis induced by hypercarbia on the guinea pig fetus.

Dr. Nahas, in collaboration with Dr. Lubos Triner and Dr. Norbert I. A. Overweg (Surgery), studied the regulation of uterine contraction by catecholamines in vitro. The relationship between smooth muscle contractility and adenyl cyclase activity was explored.

Dr. Nahas, in cooperation with Odd Steinsland, a predoctoral student in the Department of Pharmacology, State University of New York Downstate Medical Center, and Dr. Stanley Passo of the Department of Physiology, University of California at San Francisco, studied the effect of chronic hypoxia on adrenal catecholamine depletion and synthesis rate.

Dr. Yvonne Vulliemoz, Dr. Triner and Mariagnes Verosky continued their study on the metabolic effects of ethacrynic acid.

In collaboration with Dr. David V. Habif (Sur-

gery), Drs. Elias Debbas and Triner, Dr. Nahas continued to study the efficacy of fluid gelatin in the treatment of hemorrhagic shock in dogs, the fate of gelatin and changes in plasma proteins after gelatin infusion. They have also studied the suitability of fluorocarbon emulsion for the perfusion of isolated organs.

Dr. Nahas collaborated with Dr. Igal Staw and Dr. Claude Poyart, Visiting Research Associate from the University of Paris, in a study of dynamics of carbon dioxide stores in the dog.

Dr. S. H. Ngai continued his investigations on catecholamines and serotonin in collaboration with Drs. Robert C. E. Lin and Philip Liu. They examined the effects of altered brain norepinephrine, dopamine or serotonin concentration on the incidence and onset of convulsion during hyperbaric oxygenation in mice. The change in brain amine concentration was produced by pretreatment with enzyme inhibitors or amino acid precursors. Drs. Ngai and Liu studied the effect of massive dose of L-DOPA on the brain amine concentrations and on the myocardial norepinephrine stores as possible bases for postural hypotension seen in patients on L-DOPA therapy.

Dr. Lin, in collaboration with Dr. Erminio Costa, Laboratory of Preclinical Pharmacology, National Institute of Mental Health, has investigated the effects of lysergic acid diethylamide and its bromo derivation, BOL, on the turnover rate of brain serotonin in rats, using the technic of ¹⁴C-tryptophan infusion. The concept of product inhibition in respect to serotonin synthesis has been examined in rats after chronic treatment with the monoamine oxidase inhibitor, pargyline. Drs. Ngai and Lin also studied the effects of lidocaine and cocaine on behavior and brain catecholamine turnover in rats. Dr. Shirley Markee continues her study to correlate the hypotensive and bronchoconstrictive effects of narcotics and histamine release in dogs.

Dr. Robert M. Epstein evaluated the suitability of an animal model, the decerebrate cat, for the study of anesthetic action on circulatory regulation, specifically, the control of splanchnic circulation as related to splanchnic nerve discharge pattern. Dr. Ronald L. Katz, in collaboration with Dr. Llynda Hinds, and Dr. Christopher J. Mills of the Cardiovascular Research Unit, Hammersmith Hospital, London, studied the cardiac stimulant effect of glucagon in comparison with epinephrine and isoproterenol. He also evaluated an internal electromagnetic flow velocity meter (Mills probe) for the measurement of arterial blood flow.

Together with Drs. John Norman and Richard F. Seed, both of the Department of Anaesthetics, Hammersmith Hospital, Dr. Katz compared the difference of neuromuscular blocking activity of muscle relaxants between British and American subjects. Drs. Katz and Ryan studied in detail the neuromuscular blocking effects of succinylcholine in surgical patients in respect to dose response, nature of the block as related to dose and duration of its administration.

Drs. Kitz, Karis, John Savarese and Dr. Sara Ginsburg (Neurology) continued their work in developing new short-acting nondepolarizing neuromuscular blocking agents. The work involves synthesis of a series of new compounds, biochemical studies of enzymatic degradation, and testing neuromuscular blocking activity *in vitro* and *in vivo*.

In collaboration with Dr. William B. Nastuk (Physiology), Dr. Karis used single fiber nerve-muscle preparations of the frog to examine the interaction between d-tubocurarine and succinylcholine. Dr. Aaron J. Gissen collaborated with Dr. Nastuk in comparing the depolarizing and desensitizing blocking effects of succinylcholine and decamethonium on the post-junctional membrane. They also compared the neuromuscular block produced by the non-depolarizing agents d-tubocurarine and gallamine. Drs. Gissen and Katz have completed a study on the critical index of recovery from d-tubocurarine paralysis as judged from muscle response to indirect tetanic stimulation. Dr. Robert T. Donham has initiated a study on the effects of calcium ion on muscular membrane excitation.

Dr. Ralph A. Epstein is studying the effects of anesthetics and muscle relaxants on neuromuscular transmission in man, using paired stimuli to measure the refractory period and tetanic stimuli to examine the phenomenon of post-tetanic facilitation.

Drs. Hyman and Ryan collaborated with Dr. Lawrence J. Kagen (Medicine) to study the occurrence of myoglobinemia in children and adults after the administration of succinylcholine.

Drs. Herbert Rackow and Ernest Salanitre have completed their studies on the uptake of general anesthetics in infants and children as compared to that in adults. They prepared a comprehensive review on modern concepts of pediatric anesthesiology. The relative humidity of gas mixture in anesthetic circuits has been examined and steps are being taken to search for a suitable humidifier.

Drs. Brand, Mark and Hyman and Dr. James M. Perel (Psychiatry) have studied the influence of cold stress on the uptake of thiopental by brown fat

in newborn rabbits. Drs. Brand and Mark collaborated with Drs. Alvito P. Alvares, Kuntzman, Gayle Schilling and Wayne Levin, all of Wellcome Research Laboratories, in demonstrating for the first time the presence of cytochromes P-450 and b₅ in human liver microsomes.

Drs. Brand, Hilda Pederson, Kagen (Medicine), Ralph B. Dell (Pediatrics) and Hugo A. Keim (Orthopedic Surgery) are studying the incidence of myoglobinemia after major orthopedic procedures such as spinal fusion, hip arthroplasty and operation on extremities with tourniquet application.

Studies on the uptake and distribution of ⁸²Br-halothane have been completed by Dr. Ian C. Geddes, Department of Anaesthetics, University of Liverpool, Drs. Brand, Mark and Finster of this department, and Drs. Jean L. Scherrer, Stanton H. Cohn and Mr. Carl F. Dombrowski of Brookhaven National Laboratory. Data processing was facilitated by an on-line Sigma II computer. Further analysis was accomplished with a CDC-6600 computer using the SAAM program code for compartmental analysis.

The cardiopulmonary group, under the direction of Drs. Sullivan and Richard W. Patterson, have continued to study lung functions and cardiac output as affected by anesthesia and open-heart procedures. The oxygen cost of breathing in postcardiotomy patients is being investigated in collaboration with Dr. Roger S. Wilson. Dr. Irene C. Lin is studying the influence of general anesthesia on lung volumes in dogs, and Dr. Isaac Azar is examining factors influencing the redistribution of pulmonary blood flow during anesthesia. Dr. Daniel M. Philbin measured changes in cardiac output during cardiac pacing. Dr. Bernard R. Hand measured and correlated changes in lung volumes and mechanics in patients with mitral stenosis before and after cardiopulmonary bypass. Dr. J. Gilbert Stone studied the effect of shallow breathing on pulmonary shunting; Dr. Wendy A. Monkcom determined the optimal alveolar carbon dioxide concentration in respect of pulmonary compliance and airway resistance. Dr. Patterson is examining in detail changes in pulmonary mechanics during transient changes in airway or systemic carbon dioxide tension. Drs. Baratz, Philbin and Patterson studied the influence of intermittent positive pressure breathing upon plasma level of antidiuretic hormone and urine flow as related to ventilatory volume and arterial carbon dioxide tension.

Dr. Eugene Pantuck initiated a study on the effects of hypoxia and carbon monoxide on the

hepatic microsomal enzymes in collaboration with Drs. Kuntzman and Conney of Wellcome Research Laboratories. Dr. Dorothy A. Hufnagel continued her work with Dr. Sherman Beychok (Biophysics) on the molecular processes of ribonuclease reoxidation. Dr. Clyde O. Lord collaborated with Dr. Katz and Dr. Kenneth E. Eakins (Ophthalmology) in studying the effect of catecholamines on the outflow facility of the rabbit and cat eye. Dr. Jordan Miller has begun a study on the physiologic effects of prostaglandins and their antagonists in vitro and in vivo.

Dr. Letty M. P. Liu has initiated a study in collaboration with Dr. H. H. Wang (Pharmacology), on the medullary vasomotor control of cardiac output and regional blood flow in experimental animals.

The Medical Instrumentation Laboratory, under the direction of Mr. Arnold St. J. Lee, continues to provide engineering support for both clinical and

research activities of the department. The laboratory also provided consultation and engineering service to various departments at the Medical Center.

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1969 Publications

Anesthesiology

Adamsons, K.; Beard, R.; Cosmi, E. and Myers, R. E. Validity of capillary blood in the assessment of the acid-base state of the fetus. In: *Diagnosis and Treatment of Fetal Disorders*, K. Adamsons, ed., Springer Verlag, New York, 1969. p. 175.

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Biochemistry

DAVID SPRINSON

Professor and Acting Chairman of the Department

Medical and dental students as well as thirty-nine graduate students in the Faculty of Pure Science received instruction in biochemistry. Ph.D degrees were awarded to two students.

The following staff members resigned to accept positions elsewhere: Erlio Gурпide, Francis Hoskin, F. Maurice Lovell, Kenneth Roberts, Walo Leuzinger, and Herman Shapiro.

Dr. David B. Sprinson became Acting Chairman, on May 1, 1969. Drs. Max A. Eisenberg and Irwin Clark were promoted to Professor. The following members were appointed Research Associates: William Bondinell, Bonnie Bray, Brian Mee, Laura Ponticorvo, William Poillon and Reginald Potter. Dr. Warren M. Sperry retired as Professor.

Research

Drs. Reinhold and Ruth Bencsch have continued their investigations on the role of red cell organic phosphates in regulating oxygen release from hemoglobin. They have now demonstrated that hemoglobin of permanent low oxygen affinity can be prepared by covalent attachment of pyridoxal phosphate. Dr. Bonnie Anderson Bray and Mr. Robert Renthall have participated in this work.

Dr. Erwin Chargaff, together with his collaborators, continued his work on the chemistry and biology of the nucleic acids and related subjects. The work included studies on the transforming action of denatured and renatured *B. subtilis* DNA, on the preparation of single-strand specimens from denatured DNA of various microbial and viral sources,

the action of single DNA strands as templates in RNA transcription, the synthesis and activity of L-ribonucleosides and nucleotides, and the enzymic mechanisms of phosphate transfer. Participating in this work were Drs. John Karkas and Herman Shapiro, as well as Drs. Elinor F. Brunngraber, Era Cassuto, Loretta Cheong and Anna Wu, with the technical assistance of Mr. Marshall J. Stein. During the year, Dr. Chargaff gave the Miescher Memorial Lecture at the University of Basel, participated in the Miescher Symposium organized by the Max-Planck Institute in Tübingen, and delivered a series of lectures at the Zoological Station in Naples.

Dr. Max A. Eisenberg, in collaboration with his graduate students, Miss Cara Star and Mr. Kenneth Krell and Dr. Brian Mee, have continued studies on biotin biosynthesis with *E. coli* mutants, enabling them to map a large segment of the biotin locus. It has also been possible from the genetic and biochemical studies to formulate a pathway for the biosynthesis of biotin.

Dr. Jay A. Glasel continued with his studies on the application of nuclear magnetic resonance to biochemistry. He was assisted in this work by Dr. Marko Petrinovic.

Dr. Allen M. Gold has continued his studies on the structure and function of the enzyme glycogen phosphorylase, which plays a key role in the regulation of carbohydrate metabolism in muscle. Kinetic studies designed to elucidate the mechanism of action of the enzyme have been carried out in collaboration with Dr. John Tseng and Mr. Robert

Johnson, while structural studies on the enzyme molecule are being done with Mr. David Blackman. A parallel investigation of a closely related enzyme from potatoes is being done in collaboration with Mr. Guillermo Sanchez.

Dr. Samuel Graff and staff at the Francis Delafield Hospital are engaged in the production of interferon via cell culture, and the study of its efficacy in malignant disease.

Dr. Alvin I. Krasna, in collaboration with Mrs. Rita DeLeo, has continued his studies on the chain separation in the denaturation of DNA. The effect of chemical methylation of DNA on its physicochemical and biological properties has been investigated with Mr. Elliott Uhlenhopp. With Mr. Jerrold Greenberg, the effect of enzymatic methylation of DNA on its properties was studied. The properties and mechanism of action of the hydrogenase of *Scenedesmus* and *Chromatium* was studied in collaboration with Mr. Peter Gitlitz.

Dr. Barbara W. Low and her collaborators have continued their studies of the structure of proteins and peptide hormones, of small peptides and of inhibitors in the acetylcholinesterase system. With Dr. W. Wardle Fullerton, proinsulin, the single chain insulin precursor, has been crystallized for the first time. With Dr. James van der Veen, who was visiting the laboratory on sabbatical leave, the structures of two di-peptides have been solved. With Dr. F. Maurice Lovell and Mr. Andrew Rudko, the structures of S-Benzyl-L-Cysteinyl-L-Prolyl-L-Leucyl-Glycinamide, a tetrapeptide fragment of Oxytocin and of its Seleno-analog, have been determined. Dr. David Dexter has solved the structure of 2-dimethylaminoethyl seleno-benzoate, an inhibitor in the acetylcholinesterase system, and of procaine hydrochloride. With Drs. Simkin, Fullerton, Magdoff-Fairchild, Ozawa, Egguna and with Mr. Rudko, new crystalline forms of insulin prepared in the presence of lysozyme and protamine have been characterized. Protein-protein interactions which lead to initiation of new crystalline forms without formal co-crystallization, have been studied. Work on the structures of oxytocin and of insulin continues.

During the last year Dr. David Rittenberg in collaboration with Dr. Richard Caprioli studied the kinetics and mechanism of the non-oxidative conversion of glucose to ribose. In the course of this work they have found that the distribution of O^{18} in the hydroxyl groups of ribose of RNA can be determined from the fragments produced by electron bombardment of ribosides and deoxyribosides in the ion generating region of a double focusing mass

spectrometer. This has turned out to be exceedingly helpful in the study of the isotope distribution in these molecules. In collaboration with Dr. Laura Ponticorvo and Mr. Richard Johnson, he has studied the formation of the pentose sugars of RNA and DNA from O^{18} labeled glucose in several mutants of *E. coli*.

Dr. David J. Smith has continued his investigations on collagen fiber maturation *in vitro*. The biochemistry course for dental students was taught in the Spring semester with the assistance of Dr. Horace B. Gillespie.

Dr. David B. Sprinson and his collaborators have continued investigations of the enzymology and regulatory mechanisms of aromatic biosynthesis in bacteria. These included a unit of regulation of tyrosine biosynthesis, and the purification and mechanism of 3-deoxy-D-arabino-heptulosonate 7-phosphate synthetase, 5-dehydroquinate synthetase, and 3-enolpyruvylshikimate 5-phosphate synthetase. Participating in this work were Dr. Mella Adlersberg, Dr. William E. Bondinell, Dr. Jean Dayan, Dr. Edith Gollub, Dr. William Latta, Dr. John Vnek, Mr. Albert DeLeo, and Mr. Samuel Rotenberg. Dr. Sprinson delivered a lecture at the Sixth Meeting of the Federation of European Biochemical Societies in April, 1969, in Madrid.

Dr. Parithy Chery R. Srinivasan and his associates have continued their investigations on the regulation of RNA synthesis, on the biological function of methylated bases in nucleic acids and on the biosynthesis of anthranilic and p-aminobenzoic acids. Dr. Hadassah Tamir is studying the mechanism of conversion of chorismate to anthranilate by the enzyme, anthranilate synthetase. Dr. Bantval S. Baliga has compared the elution profiles of 18 aminoacyl-tRNAs from Novikoff hepatoma with those from normal liver on methylated albumin-kieselguhr columns. These studies revealed the occurrence of new species of tRNA for histidine, tyrosine and asparagine in the hepatoma. In addition the hepatoma tRNAs for arginine, isoleucine, lysine, methionine, serine, alanine and tryptophan differed in their elution profiles as compared to normal liver. These studies are being extended to Morris hepatoma. We have also initiated biochemical studies on the mechanisms underlying mutagenesis by alkylating agents.

The departmental seminars were addressed by many distinguished visitors, among whom were: Dr. Emanuel Riklis, Israel Atomic Energy Commission, Dr. Robert Thomas, Imperial College of Science and Technology, Dr. Joel Mandelstam, University of Oxford, Dr. Peter F. Knowles, University of

Leeds, Dr. Marshal Nirenberg, National Heart Institute, Dr. Esmond Snell, University of California, Dr. James A. McCloskey, Baylor University, Dr. Bernard Witkop, National Institutes of Arthritis and Metabolic Diseases, Dr. Benjamin Shapiro, Hebrew University, Dr. Alton Meister, Cornell University, Dr. Ethan R. Singer, Massachusetts Institute of Technology, Dr. William T. Norton, Albert Einstein College of Medicine, Dr. Alexander Tomasz, The Rockefeller University, Dr. Max Tishler, Merck Sharp & Dohme Research Laboratories, Dr. Melvin Cohn, Salk Institute for Biological Studies, Dr. Philip Marcus, Albert Einstein College of Medicine, Dr. Doris Balinsky, University of the Witwatersrand, Dr. Bernard Weiss, Johns Hopkins University, Dr. Eric Shooter, Stanford University, Dr. Harlyn O. Halvorson, University of Wisconsin, Dr. Vernon M. Ingram, Massachusetts Institute of Technology, Dr. Israel R. Lehman, Stanford University, Dr. Bernard D. Davis, Harvard University, Dr. Hans T. Clarke, Children's Cancer Foundation, Dr.

Leon A. Heppel, Cornell University, Dr. William N. Lipscomb, Harvard University, Dr. William B. Wood, California Institute of Technology, Dr. Richard W. Moyer, Massachusetts Institute of Technology, Dr. Charles L. Hershberger, University of Wisconsin, Dr. Peter C. Hinkle, Cornell University, Dr. Lars Ernster, Stockholm University, Dr. Robert C. MacDonald, ARC Institute of Animal Physiology.

Acknowledgment

The activities of the department received support during the year through grants from the American Cancer Society, the American Heart Association, the Atomic Energy Commission, the Damon Runyon Memorial Fund for Cancer Research, E. I. duPont de Nemours and Company, the Health Research Council of New York, the Office of the Naval Research, the National Institutes of Health of the United States Public Health Service, the National Science Foundation and the Rockefeller Foundation.

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Dermatology

CARL T. NELSON

Professor and Chairman of the Department • Director of Service

Teaching

Major revisions in the teaching program of the department were required this year to meet the needs of the new core curriculum for medical students. Inasmuch as most of our staff is part-time and voluntary, it has been necessary to develop effective teaching programs which simultaneously strengthen the other important functions of the department, namely, patient care, residency and post-graduate training, and research. By next year when all of the revised curriculum will have been instituted, we hope that it will accomplish these objectives: 1) the introduction of clinical dermatology at an earlier stage of medical training; 2) the development of a core curriculum in dermatology directed toward a firm understanding of cutaneous expressions of disease; 3) a closer cooperation between the basic science departments and this department in the teaching of dermatology; and 4) the organization of a varied elective program which will fulfill the needs of a diverse group of students requesting additional training in dermatology. Included in these various teaching efforts will be bedside demonstrations in the course on introduction to the patient, eighteen hours of teaching of clinical dermatology to small groups during the major clinical year, and out-patient clerkships as well as externships in dermatology during the elective period. Dr. Saul L. Sanders has been in charge of this restructuring of the teaching program.

Changes in Staff

Promotions effective July 1, 1969, included those of Dr. Sanders to Associate Clinical Professor; Dr. Irving Abrahams and Dr. Jack Eisert to Assistant Clinical Professor; and Dr. Louis A. Fragola to Instructor. Dr. Sanders, Dr. Lewis Shapiro, Dr. Richard A. Walzer and Dr. Alexander W. Young, Jr. became Attending Dermatologists in the Presbyterian Hospital and Dr. Einar A. Juhlin was promoted to Attending Dermatologist in Vanderbilt Clinic.

New appointees to the staff during the year were Dr. Henry L. Hines as Assistant Clinical Professor, assigned to Harlem Hospital, and Drs. William R. Barbee, Lois K. Feinerman, Karl W. Waterson and Joseph A. Penner as Assistant Dermatologists in Vanderbilt Clinic. Dr. Irene Weitzman resigned on September 30, 1969, to accept new responsibilities as Director of the Mycology Laboratory, Department of Health, City of New York.

Staff Honors and Activities

Dr. Arturo L. Carrion and Dr. Elizabeth L. Hazen each received honorary degrees of Doctor of Science during this year. The degree granted to Dr. Carrion by the University of Puerto Rico recognized a half century of dedicated research and teaching in medical mycology. Dr. Hazen's degree was granted by Hobart and William Smith Colleges for her discovery, with Dr. Rachel Brown, of nystatin — the

first clinically effective antibiotic for the treatment of fungal infection.

Dr. Abrahams was elected president of the Metropolitan Dermatological Society and Dr. Anthony N. Domonkos became Secretary-Treasurer of the New York Dermatological Society. Dr. Domonkos also continued to serve as Treasurer of the American Dermatological Association. Dr. Peter C. Lombardo was elected Secretary-Treasurer of the Metropolitan Dermatological Society and Dr. J. Lowry Miller again served as Treasurer of the Dermatology Foundation.

Dr. Nelson visited Israel to deliver the Wershaw Lectures, sponsored by the American Academy of Dermatology. During his stay, Dr. Nelson lectured at medical schools and hospitals in Tel-Aviv, Jerusalem and Haifa. Dr. Lewis Shapiro was a guest lecturer at the Atlanta Dermatological Society and also served as a member of the faculty at the annual meeting of the International Academy of Pathology.

Dr. Margarita Silva Hutzner was reappointed as a member of the Standards and Examinations Committee for Public Health and Medical Laboratory Mycology of the American Board of Microbiology. With Dr. Carrion, Dr. Silva-Hutzner also served as co-chairman of a symposium on opportunistic fungal pathogens at the Second World Congress of the International Society for Tropical Dermatology held in Kyoto, Japan. During her stay in the Far East, Dr. Silva-Hutzner visited mycology laboratories in Japan and Thailand under the auspices of the World Health Organization. Dr. Hilda G. Straker became Chief of Dermatology at Harlem Hospital and Dr. Walzer was appointed to the Committee on Residency Training of the National Program for Dermatology.

Patient Care

In 1969, out-patient visits to dermatology in Vanderbilt Clinic totalled 23,141. Thus, the annual number of such visits has now remained relatively stable for the past three years and we assume that previous long-term trend toward fewer out-patient clinic visits has ended.

During the year 107 patients were admitted to the dermatologic ward and 563 additional patients were treated in consultation with other services. The Serological Research Laboratory performed 667 specific treponemal tests for patients admitted to the Medical Center and the Mycology Laboratory examined 3,627 specimens.

Research

Dr. William G. Atwood and Dr. Miller completed a study on the immunoglobulin class of the treponemal antibodies found in the various stages of syphilis. Mrs. Julia M. Einbinder and Dr. Walzer investigated an *in vitro* test for delayed hypersensitivity, utilizing sensitive peripheral lymphocytes from venous blood. No evidence was found to indicate that cytotoxic or other pharmacologically active mediators are produced by antigen-challenged human peripheral lymphocytes in amounts that can be assayed in tissue culture, although other species do produce such substances. Mrs. Einbinder also completed a study of the phagocytic activity of the neutrophiles of children with cystic fibrosis. The results indicate that a defect exists in a lysosomal enzyme involved in the breakdown of phagocytized material in approximately two-thirds of the children with this disease and their asymptomatic parents and sibs.

Dr. Kenneth O. Lloyd continued his investigation of the chemistry and immunochemistry of polysaccharides and glycoproteins. A new method for the isolation and fractionation of polysaccharides, utilizing insoluble forms of the phytohemagglutinin, concanavalin A, has been developed. Together with Drs. Silva-Hutzner, William G. Merz and Robert Feinstein, Dr. Lloyd also investigated methods for the isolation and purification of an antigen suitable for detecting delayed type hypersensitivity in sporotrichosis.

Dr. Sanders, with Dr. Eisert and Dr. Theodore A. Labow studied the clinical effectiveness of retinoic acid in the treatment of psoriasis. Utilizing immunofluorescent techniques, Drs. Sanders and Feinstein, with Mrs. Einbinder, also initiated a study of the antibodies to epidermal intercellular and basement membrane substances in chronic bullous disease. Drs. Shapiro, Walzer and Joel Teisch completed a clinical investigation of the association of cutaneous eruptions and infection with *Mycoplasma pneumoniae*.

Dr. Silva-Hutzner completed a genetic study of segregation in *Arthroderma uncinatum*. With Dr. Penelope Allderdice of the Department of Obstetrics and Gynecology, she also investigated the cytology of the chromosomes in the perfect states of certain species of *Microsporum* and *Trichophyton*. Drs. Silva-Hutzner and Merz also continued their comparison of the antigens derived from the spore types of the fungi of chromoblastomycosis, utilizing fluorescent antibody techniques. Dr. Young continued his investigation of exfoliative cytology

in diseases of the vulva and, with Drs. Elaine V. DiGrande and Lawrence T. Wagers, also initiated a study of the value of zinc sulfate in the local treatment of ulcers of the lower leg.

Acknowledgments

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Human Genetics and Development

PAUL A. MARKS

Professor and Chairman of the Department • Attending Physician

The Department of Human Genetics & Development was established in the Faculty of Medicine on July 1, 1969.

The past two decades have witnessed great progress in the elucidation of problems in fundamental genetic mechanisms and details of basic molecular and cellular processes. The application of this basic biological information to the problems of human genetic, reproduction and developmental disorders has been increasing but remains relatively meager. In part, this reflects a lack of trained professionals, who are involved in research, teaching and clinical care activities in these areas. The department will offer programs of instruction in the areas of human genetics, reproductive biology and development for medical students as well as for candidates for the Ph.D. degree enrolled in the University's Faculty of Pure Science. It will also offer postgraduate training programs for M.D. and Ph.D.'s who are interested in problems of these areas.

A major program in the department is the exploitation and expansion of the methodology and conceptual framework of cellular and molecular genetics to the solution of problems which bear directly upon human disease including genetically determined disorders of human development and viral oncology. Programs underway in these areas are summarized below. Another major area of ac-

tivity in the department will be concerned with the application of the important advances in our understanding of nucleic acid and protein synthesis and structure, immunochemistry, cell structure and function and genetic mechanisms to a study of the reproductive processes.

Faculty

The department was initially organized with a faculty of five members: Elvin Kabat, holding a joint appointment with the Department of Microbiology; Orlando J. Miller, holding a joint appointment in the Department of Obstetrics and Gynecology; Paul A. Marks and Richard A. Rifkind, holding joint appointments in the Department of Medicine, and Sol Spiegelman who joined the faculty on July 1, 1969 from the Department of Microbiology, University of Illinois. During the past six months, the department has recruited Dr. Kimball Atwood from the University of Illinois; as Assistant Professors, David L. Bishop and Donald R. Mills, and as Associate, Dorothy Warburton. Drs. Harold Calvin, David Chui and Jeffrey Schlom have been appointed Instructors. The part-time teaching staff of the department was augmented with the appointment of Adjunct Professors Sidney Udenfriend, Arthur Weissbach and Herbert Weissbach and Adjunct Assistant Professor John Hutton.

These scientists are members of the Roche Institute for Molecular Biology.

Postdoctoral fellows in the department include Drs. Foloyan Esan, Fred Kramer, Donald Komma, Franco Mangia, Franco Mineo-Paluello, Masaaki Terada, Kenneth Watson and Ming Yu.

During the past year Dr. Marks was a Visiting Professor in the Biology Department of Harvard University and participated in the Clinical Scientists Training Program at Rochester University School of Medicine and the Developmental Biology Training Program at the University of California School of Medicine, in San Diego. He served as a Chairman and Speaker at the IX International Congress of Embryology held in Moscow and was a lecturer at the Institute of Biophysics and Biochemistry in Paris. Dr. Marks was appointed to the Advisory Panel of the Hematology Training Grants Program with the National Institutes of Health and as a consultant on research grants of the Veterans Administration. He was elected Co-Chairman of the Committee on Scientific Affairs, the American Society of Hematology and to the Scientific Advisory Board of the Roche Institute of Molecular Biology. He continues to serve as editor of the *Journal of Clinical Investigation*. Dr. Spiegelman was director of a course on DNA/RNA hybridization in Pavia, Italy, and an invited speaker at the Centennial Celebration of the discovery of nucleic acids held in Tübingen. Dr. Atwood was a Visiting Professor in the Developmental Biology Training Program at the University of California School of Medicine in San Diego and participated in the National Institutes of Health summer workshop on aging. He served as a member of the Planetary Biology Subcommittee of NASA and the panel of non-psychiatric hazards of drug abuse of the Department of Health, Education and Welfare. Dr. Kabat is serving on the National Research Council Committee on Plasma and Plasma Substitutes, is Chairman of the National Academy of Sciences Committee on Latimeria, and a member of the National Science Foundation's Molecular Biology Panel. He delivered a talk at the International Congress of Clinical Pathology in Montreal, and the Jules Freund Memorial Lecture at the National Institutes of Health and spoke to the Chilean Microbiology and Hematology Societies in Santiago, Chile. He participated in conferences on developmental aspects of the antibody response in Prague, and on evolution of the antibody response at the Argonne National Laboratory and World Health Organization Centers for Research and Training in Immunology at São Paulo, Brazil and Mexico City. He was elected Membre Correspondant Etranger of

the Société de Biologie in Paris. He is an Associate Editor of the *Journal of Immunology* and serves on the Scientific Committee of the New York Blood Center. Dr. Miller is editor of the *Cytogenetics Journal* and was appointed to the editorial board of the *American Journal of Human Genetics*. He was one of the organizers and participated in the symposium on the use of tissue culture in the diagnosis of genetic disease at the European Society of Human Genetics meetings in Liverpool, and was a plenary speaker at the Third International Congress on Congenital Malformations in the Hague. Dr. Rifkind lectured at the IX International Conference of Embryology in Moscow. He was elected President of Eastern Section of the American Federation for Clinical Research. He continues to serve as a panel member of the National Science Foundation Advisory Panel on Developmental Biology and on the editorial board of the *Journal of Histochemistry and Cytochemistry*. Dr. Sidney Udenfriend was honored by the Ames Award of the American Association of Clinical Chemists.

Patient Care

In addition to programs in instruction and research, the department is organizing patient care activities in the area of genetic diagnosis and genetic counselling. The department will provide an out-patient and in-patient consultation service for diagnosis, therapy and counselling in genetics and developmental diseases. The department will not have an in-patient bed service. A genetics diagnostic laboratory under the direction of Dr. Dorothy Warburton has been established in the Presbyterian Hospital and it is providing a variety of services including sex chromatin analysis and chromosome studies.

Research Activities

Dr. Atwood, along with Drs. Donald Komma and Ming Yu has been concerned with the genetics of bulk RNA components in a variety of organisms.

Drs. Marks, Rifkind, Arthur Bank (Medicine) and their collaborators have been pursuing research programs in the areas of erythroid cell differentiation and control of protein synthesis. With Drs. Bank, Joseph Fuhr and Clayton Natta investigations are being conducted on the genetically determined hemolytic anemia, thalassemia.

Dr. Rifkind, with Drs. David Chui, Djaldetti, Mineo-Paluello and Marks, has been studying erythroid cell differentiation with particular emphasis on the action of the hormone erythropoietin. Drs. Terada, Preisler and Mrs. Judy Jones with Dr. Marks

have developed techniques to define the genetic control of gene expression as erythroid cells differentiate in fetal mice. With Dr. Franco Mangia and Mrs. Robin George, Dr. Marks is studying messenger RNA for hemoglobin.

Dr. Rifkind with Drs. Chui and Djaldetti has studied the regulation of differentiation in mammalian fetal erythroid cell precursors. The cellular basis for stabilization of hemoglobin synthesis was defined.

Dr. Miller was on sabbatical leave for the past year working as a National Science Foundation Senior Postdoctoral Fellow with Professor Henry Harris at Oxford University. Drs. Miller and Harris, in collaboration with Drs. George Klein, Peter Worst and T. Tsehibana, all of the Department of Tumor Biology, Karolinska Institutet, Stockholm, has studied the growth of three types of mouse ascites tumor cells. Dr. Miller has collaborated with P. R. Cook of the Dunn School of Pathology and Professor M. Siniscalco and Dr. P. Meera Khan of the Institut Voor Anthropogenetics, Leiden University, in a study of X-linked markers in mouse-human hybrids.

Dr. Spiegelman in association with Drs. Bishop, Mills, Burny, Huang, Travniek, Watson, Schlam, Keydar, Das and Kramer has instituted a program in viral oncology. Their approach stems from earlier investigations with the QB, an RNA virus which infects *E. coli*. An enzyme induced by this virus has been purified and shown to catalyze the indefinite synthesis of biologically competent and infectious RNA.

The immunochemical laboratories under Dr. Kabat involved the Departments of Microbiology, Neurology, and Human Genetics and Development. During the past year studies were performed on the purification and properties of human antibodies to various carbohydrate antibodies and the purification and characterization of plant hemagglutinins (lectins) which showed blood group A specificity. Another major area of investigation was the chemistry of the blood group, A, B, H, Le^a and Le^b substances. A

more detailed description of research activities of Dr. Kabat and his collaborators is given in the report of the Department of Microbiology.

Two major programs are being pursued in the laboratory of Dr. Udenfriend. The first concerns the biosynthesis of collagen. The second major program concerns studies on factors which regulate synthesis of norepinephrine in the sympathetic nervous system and in the brain. Dr. A. Weissbach has been studying the enzymes controlling DNA synthesis in animal cells grown in tissue culture. The DNA polymerase of HeLa cells and a new endonuclease, directed by phage λ , which seems to be necessary for the phage DNA synthesis are being studied.

Dr. H. Weissbach and associates are concerned with two major areas of research, the role of guanosine triphosphate in protein synthesis and the mechanism of action of vitamin B₁₂ coenzymes and their role in one carbon metabolism.

The laboratory of Dr. John J. Hutton is pursuing information about the position on chromosomes of genes with known biochemical functions. He has determined the gene linkage relationships of loci which control the structure or activity of the following proteins: kidney esterases, autosomal glucose-6-phosphate dehydrogenase, glucosephosphate isomerase, hemoglobin α - and β -chains, isocitric dehydrogenase, lactic dehydrogenase regulator, levulinate dehydratase, malic dehydrogenase and phosphoglucomutase.

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Medicine

STANLEY E. BRADLEY

Bard Professor and Chairman of the Department • Director of Service

The Department of Medicine has felt increasingly during the past year the thrust of a variety of new pressures and needs that are operating everywhere to change the patterns of medical care and medical instruction. More patients with serious life-threatening diseases are reaching the hospital; more effective management is saving lives of many who used to die soon after admission and who now convalesce after weeks of devoted care; more complex therapeutic modalities require an abundance of skilled medical manpower. At the same time, a steady decline in the number of local practitioners is creating a need that hospitals must meet in some manner. Reorganization and recruitment of staff is necessary not only to meet these demands but also to take advantage of the opportunity provided by curricular changes that will enhance and accelerate the acquisition of clinical skills. At the Medical Center and elsewhere, important new developments during 1969 reinforced departmental efforts to move with and ahead of the times.

Adequate manpower of high quality and high potential is the major problem. The department's prime mission lies in this area. Through its work in training medical students, interns and residents, it adds continually to the manpower pool and in doing so, strengthens its position in providing care locally. Thus, the Trustees' decision to expand the house staff by the addition of a total of sixteen new positions, has made possible a restructuring of the Medical Service at Presbyterian Hospital from three

to four Services and the establishment of two newly constructed, modern intensive-care units to replace the Center Services. Increase in coverage at the "Front Door" has greatly increased efficiency in handling medical emergencies and admissions; better follow-up is assured in the clinic. In addition to augmenting the department's production of highly skilled young internists by 45 percent, the larger staff provides a complement of enthusiastic and stimulating teachers at a time when reduction in governmental support of research and training programs poses a very serious threat to maintenance of full-time staff. The past availability of funds for research and the provision of new space in the Black Building has made possible a more than 100 percent expansion in the full-time cadre during the past decade, together with a proportional growth of productive investigation, post-graduate training and activity in the medical specialties. Diversification of support and a high standard of medical scholarship give firm assurances for the future at the Medical Center, though a slower growth rate may be anticipated.

In meeting community needs, a variety of facilities and personnel must be enlisted rapidly and soon. At the Medical Center a greatly enlarged admitting emergency area is now under construction and it is hoped that space and funds will be found to expand all ambulatory care functions. Plans for reorganization and extension of medical out-patient work are in the making. The close ties with Harlem and

Delafield Hospitals are growing stronger and more effective, both with respect to teaching and to collaborations in patient care that hold great promise for the development of a joint enterprise in ambulatory medicine. A closer affiliation with St. Luke's and Roosevelt Hospitals, that is currently under study, would add a new dimension to all these undertakings. In all, however, staff recruitment and support is an essential ingredient that cannot be achieved by mandate but must depend upon a determined, understanding and cooperative effort by the community and profession.

Staff Changes and Honors

The department lost one of its most loyal and distinguished members in the death of Dr. I. Ogden Woodruff at the age of 89 on May 26, 1969. Dr. Woodruff was Director of the First (Columbia University) Medical Division at Bellevue Hospital for many years, returning in 1945 as Clinical Professor Emeritus of Medicine. He is warmly remembered by all who worked with him as a perceptive physician, an outstanding diagnostician, and a sympathetic and stimulating mentor. Dr. Daniel V. Kimberg resigned to assume direction of the Gastroenterology Training Program at Beth Israel Hospital as an Assistant Professor of Medicine at Harvard Medical School. After a year of training with Sir Ashley Miles at the Lister Institute in London, Dr. David J. McConnell has returned to the department as an Assistant Professor to take Dr. William B. Sherman's place as Director of the Allergy Clinic. Dr. Sherman has asked to be relieved of this duty for reasons of health after many years of loyal and skillful service. Dr. McConnell will be joined in his new task by Dr. John T. Connell as Co-director. Dr. Edward E. Fischel, Director of the Department of Medicine at the Bronx-Lebanon Hospital Center also returned to teaching duties in the department as Associate Clinical Professor of Medicine. An exciting new development has been the creation of a Department of Human Genetics and Development under the chairmanship of Dr. Paul A. Marks. Dr. Richard A. Riskind has joined Dr. Marks in this enterprise. Both will continue to devote a major effort, as in the past, to clinical teaching and to the hematology training program in the Department of Medicine.

Harvard University conferred an honorary degree (Sc.D.) upon Dr. Robert F. Loeb at its annual commencement in June. Dr. Andre Cournand received the degree of Doctor Honoris Causa from the University of Nancy (France). He was made an honorary member of the American Thoracic Society, lectured in Switzerland and Italy, and served as

chairman of the International Symposium on Pulmonary Circulation in Prague, the Section on Ventilation/Perfusion Relationships in the Symposium on Standard Values in Pulmonary Function Tests in Sassari, Italy, and the Symposium on Organ Transplantation of the National Academy of Sciences in Washington. Drs. Dickinson W. Richards and Cournand participated as speakers at the Conference of Nobel Prize Laureates in Lindau, West Germany. The Institute for the Study of Science in Human Affairs has continued to sponsor the work of Drs. Richards and Cournand in organizing seminars and course work in the "History of Medicine" and "Medicine and Society", and experimentation in computer-aided instruction in the department. On behalf of the Association of American Physicians at its annual meeting in May, Dr. Richards presented the Association's highest honor, the Kober Medal, to Dr. Dana W. Atchley in recognition of his contributions to medical education and research.

Dr. Stanley E. Bradley served as Visiting Professor of Medicine at the University of North Carolina School of Medicine, Visiting Lecturer at Duke University School of Medicine, and Holmes Lecturer at the University College Hospital in London. He continued as a member of the Board of Scientific consultants of the Sloan-Kettering Institute and completed a term as chairman of the Visiting Committee of the Medical Department at Brookhaven National Laboratory. He is also President-Elect of the New York Heart Association. Dr. Charles L. Christian was an invited participant in the Symposium on Immune Complex Disease at Spolito, Italy. He continued to serve as a member of the General Medical Study Section of the United States Public Health Service. Drs. Harry W. Fritts and DeWitt S. Goodman continued to serve as Associate Editors of the *Journal of Clinical Investigation*. The Association of Career Scientists of the Health Research Council of New York City elected Dr. Goodman to chairmanship and to the membership of the Executive Committee of the Health Research Council. He is also a member of the Editorial Board of the *Journal of Lipid Research* and the Metabolism Study Section of the National Institutes of Health. He was invited to lecture in London and Cambridge, England, and to the Biochemical Society of Stockholm, Sweden. Dr. Rejane M. Harvey has been made chairman of the Criteria Committee of the New York Heart Association.

Dr. Julia M. Jones was elected to the Board of the National Tuberculosis and Respiratory Disease Association as Director-at-large. Dr. John H. Laragh was co-recipient of the Stouffer Prize for 1969 for

the discovery that aldosterone secretion is greatly elevated in malignant hypertension and that angiotensin release is largely responsible for the control of aldosterone secretion. He also served as chairman of the Council for High Blood Pressure Research of the American Heart Association. The American Thyroid Association appointed Dr. Sidney C. Werner one of its Directors for a four year term and chairman of its Committee on Nomenclature of Thyroid Disease. He served as Visiting Professor at the University of Minnesota School of Medicine and Visiting Faculty Member at the Mayo Graduate School of Medicine and Mayo Clinic. Dr. Nicholas P. Christy was elected to the membership of the Association of American Physicians, and was appointed to the National Institutes of Health Diabetes and Metabolism Training Grants Committee and to the Advisory Committee for the Recurring Bibliography of Endocrinology of the National Library of Medicine. Baylor University School of Medicine invited Dr. M. Irene Ferrer to serve as a Visiting Professor of Medicine. Dr. Hamilton Southworth continued to serve on the American Board of Internal Medicine. Dr. Theodore B. Van Itallie was on leave of absence as Visiting Professor of Medicine at the American University of Beirut (Lebanon). He served as President of the American Board of Nutrition and as a member of the Council on Foods and Nutrition of the American Medical Association. He was appointed Vice-Chairman, Panel on Advanced Academic Teaching of Nutrition, The White House Conference on Food, Nutrition and Health, and to the membership of the Gastroenterology and Nutrition Training Committee, NIAMD.

Dr. Robert E. Canfield was invited to lecture at the International Workshop on the Chemistry of Gonadotropins in England. Dr. Richard A. Rifkind was named President-Elect of the Eastern Section, American Federation for Clinical Research. He was an Invited Lecturer at the IX International Embryology Conference in Moscow, USSR, and served on the Editorial Board of the *Journal of Histochemistry and Cytochemistry* and on the National Science Foundation Panel on Developmental Biology. Dr. Gerard M. Turino was appointed Associate Editor of *Respiration*, Vice Chairman of the American Heart Association Mid Atlantic Regional Committee on Professional Education, and to the membership of the Study Panel on Cardiovascular Disease of the New York Metropolitan Regional Medical Program. The National Foundation for Neuromuscular Diseases elected Dr. George W. Melcher, Jr. as its president. Dr. Melcher is also president of

Group Health Insurance, Inc. Dr. John L. Bertles was invited to participate in the First International Sickle Cell Symposium at the University of the West Indies in Kingston, Jamaica. He served on the Board of Directors of the Foundation for Research and Education in Sickle Cell Disease and on the Medical Advisory Committee of the Leukemia Society of America. Dr. Edward E. Fischel completed his term of office as President of the American Rheumatism Association, accepted election as Vice President of the New York Academy of Medicine and serves on the Health Research Council of New York and on the Technical Consulting Panel on Continuing Medical Education of the New York Metropolitan Regional Medical Program. Dr. Peter R. Holt was elected to the membership of the American Society for Clinical Investigation. He was invited to lecture at the International Symposium on Malabsorption in Montreal. Dr. Yale Enson was also elected to membership of the American Society for Clinical Investigation and to the Medical Advisory Board of the Council on Circulation of the American Heart Association. Dr. E. Carwile LeRoy was elected to the membership of the Society for Experimental Biology and Medicine and the American Association of Immunologists. Dr. Dudley F. Rochester was made a member of the Eastern Section of the American Thoracic Society. Dr. Charles P. Felton continued service on the Board of Directors of the New York Tuberculosis and Health Association. Dr. George A. Hyman was named Editor-in-Chief of the *American Journal of Therapeutics and Case Reports*. The New York Allergy Society named Dr. Michael H. Grieco its Secretary. The American Association for Inhalation Therapy awarded its Golden Tree of Life Award to Dr. Gustav J. Beck who was also named President of the American Association for Clinical Immunology and Allergy (Eastern Section), Governor of the American Academy of Compensation Medicine and Co-Director of the School of Inhalation Therapy at the Manhattan Community College and Lenox Hill Hospital. Dr. Philip W. Brickner was made Chief of Ambulatory Services at St. Vincent's Hospital. Elected to membership of the American Society for the Study of Liver Diseases were Drs. Peter Holt and Joseph Sweeting; to Fellowship of the American College of Physicians, Drs. William J. Athos, Michael Grieco and Sweeting; to membership of the American Gastroenterological Association, Drs. Norton S. Rosenzweig and Sweeting; to Fellowship of the American College of Gastroenterology, Dr. Kenneth A. Altman; and to membership of the Endocrine Society, Dr. William Rosner.

Patient Care and Teaching

The Medical Service at Presbyterian Hospital cared for 4640 patients during 1969, for an average of 17.9 days. In terms of broadly defined disease categories, cardiovascular illness, including nephropathies, accounted for 48 percent, bronchorespiratory diseases for 11 percent, gastrointestinal disorders for 11 percent, hematologic and neoplastic disease for 8 percent, metabolic and endocrine pathology for 7 percent, and rheumatic and connective tissue disorders for 4 percent. A total of 26,092 new patients were seen in the Admitting and Emergency Clinics in the course of 44,314 visits. The Group and Medical Clinics cared for 11,587 new patients. Reorganization of the clinics has been undertaken with the purpose of providing more prompt and efficient care for a larger number of patients and better arrangements for a variety of clinical "electives" for third and fourth year students. Newly constructed Cardiac Monitoring (9 Center) and Intensive Care (8 Center) Units were opened for use in September. Improvements in equipment and space are making care of cardiac and bronchorespiratory emergencies much more efficient and teaching more effective. Dr. J. Thomas Bigger has been given the task of administering the Cardiac Intensive Care Unit and Dr. Hamilton Southworth will serve as Chairman of the Unit's Advisory Committee. Dr. Bigger is engaged in a joint program with Dr. Raymond Bonner (IBM) to develop computer programs for interpretation of cardiac arrhythmias in patients. Preliminary work has been so satisfactory that long term on-line computer analysis will be tested by transmitting electrocardiograms directly from patients on the Unit to an IBM 1800 computer in Yorktown Heights.

The Medical Service at Delafield Hospital, under the direction of Dr. George L. Curran, completed its first full year since its move from Goldwater Memorial Hospital. The conversion of the Service from an Oncology Service to a General Medical Service has been carried out and the successful transfer of the senior medical student clerkship from Goldwater accomplished. Second year residents (Presbyterian Hospital) are in charge of the wards and are working closely with the Presbyterian Admitting and Ward Services. The Clinical Oncology Diagnostic Service has been reorganized by division of patients into two major groups. Hodgkin's Disease and the lymphomas are being supervised at Delafield by Drs. Hyman and Grossbard under the aegis of hematology. Dr. David Rosen, with Drs. Weinstein, Kitchin, DeBellis and Edwards, has as-

sumed responsibility for patients with solid tumors. First year medical residents from Harlem Hospital have rotated through this Clinical Oncology Service at Delafield on a monthly basis.

The fourth year clinical clerkship in Harkness Pavilion has proved to be an attractive elective. In Harkness, the students have an opportunity to work closely with clinical teachers in practice under the supervision of regular attending physicians and first year medical residents. Cardiovascular and renal disease made up 31% of admissions; hematologic and neoplastic disorders, 18%; gastrointestinal disease, 18%; bronchorespiratory disease, 6%; endocrinology, 3%; and skeleto-muscular disorders, 3%. This spectrum of pathology provides an unusual opportunity for learning. Fourth year medical clerkships are also well-attended at St. Luke's, Roosevelt, and Harlem Hospitals.

The Medical Service at Harlem Hospital has recruited a full house staff consisting of 21 straight medical interns, 23 rotating interns (spending 65% of their time on Medicine) and a total of 36 residents. All but one are American trained. In September 1969, the move into the new Tower Building at Harlem Hospital was made. For the Department of Medicine this meant two full floors, and two half floors, a total of 215 acute beds. These include a four-bed metabolic unit and an admission unit for chest diseases. Temporarily, while renovation of the Women's Pavilion is going on, 45 extended care general medical beds on the 7th floor and 40 extended care tuberculosis beds in the K Building are in use. When the renovation is complete — presumably in mid 1970-80 — extended care tuberculosis beds will be located in the old Women's Pavilion. In the space in the Tower Building there are a minimal number of offices, two small research laboratories, and a fluoroscope with an image intensifier on the 14th floor; a conference room and departmental library on the twelfth floor; an EEG laboratory on the third floor. Electrocardiography is housed on the sixth floor.

A number of distinguished visitors from other institutions in this country and abroad have contributed importantly to the teaching program. The department presented a postgraduate course on hormonal regulation in health and disease in January 1969 under the aegis of the American College of Physicians that brought Dr. R. Landau from the University of Washington, Dr. A. M. Bongiovanni from the University of Pennsylvania, Drs. D. Federman, A. Leaf, and L. Sherwood from Harvard University, Dr. R. Levine from New York Medical College, Dr. P. C. MacDonald from Southwestern

University, and Dr. M. B. Lipsett from the NIH, to the Center. In addition, Dr. William B. Castle from Harvard, and Dr. Keith B. Taylor from Stanford University served for one week each as Visiting Professors. Foreign visitors who participated in rounds and combined clinics included Professor Sir Hans Krebs (Oxford), Professor William Feindel (Montreal), Professor Graham M. Bull (London), Professor O. Schildknecht (Munsterlingen, Switzerland), Professor Christopher Pallis (London), Professor C. J. Dickinson (London), and Professor S. Sambursky (Jerusalem).

Research

Respiratory and cardiovascular physiology in health and disease continues to be a major focus of the investigative effort in the Cardiorespiratory Laboratory under the direction of Dr. Harry W. Fritts, Jr. In studies on dogs, Drs. Peter Caldwell, Ronald Wigle, Henry Heinemann (Cornell University) and Fritts find that neutral lipids and phospholipids are increased and that radioactive pulmitate incorporation is not affected by granulomatous disease of the lungs in dogs. The oxygen utilization of granulomatous tissue *in vitro*, as measured by Drs. Caldwell and Joseph S. Schwartz, is higher than normal lung tissue. Preliminary results obtained by Drs. Wigle and Schwartz indicate, however, that "shunt-flow" is the most important determinant of alveolar-arterial oxygen gradient in dogs with developing granulomatous disease.

The pulmonary circulation has received special attention with respect to its response to such stimuli as acidosis by Drs. Yale Enson, Rejane M. Harvey, Thomas Q. Morris, and Donald Schmidt who have sought to use experimental cholera in the dog as a means of producing a profound acidosis. The effect of induced acidosis and alkalosis in volunteer human subjects upon the whole blood content of 2.3 diphosphoglycerate and the affinity of hemoglobin for oxygen is under study by Drs. Harry M. Thomas III, Stephen S. Lefrak, Caldwell and Fritts. Drs. Enson and Harvey are continuing a statistical evaluation of the effects of other physiologic and pharmacologic agents on the relationship between the pulmonary arterial diastolic and the left ventricular filling pressures, and the pulmonary blood volume. Drs. Turino, John Burris, Donald Schmidt and John Carey are following changes in extravascular lung water content during exercise in patients with pulmonary hypertension. Dr. M. Irene Ferrer has completed a study in collaboration with Dr. Margaret Kilcoyne, of electrocardiographic findings in 200 patients with emphysema.

With Drs. Ines Mandl and John Carey, Dr. Gerard M. Turino has been studying the relationship between inherited deficiency of alpha₁-antitrypsin in human serum and the development of pulmonary emphysema. Dr. Alvan L. Barach has continued a program of treating emphysematous patients by abdominal compression and pulmonary deflation instead of intermittent positive pressure breathing. Dr. Hylan A. Bickerman, together with Drs. Edith B. Reilly and John M. Rodgers, have continued his investigation of the effect of environmental factors on basal airway resistance. They are also making pressure-flow tracings in the body plethysmograph following the inhalation of low concentrations of citric acid and mecholyl aerosols to show increases in bronchial airway resistance which appear to be dose dependent. Dr. Dudley F. Rochester has been successful in devising a method of catheterizing diaphragmatic veins in man which has made it possible for him to apply his method of measuring diaphragmatic blood flow to obtain values for diaphragmatic oxygen consumption. With Dr. Roberta Goldring (New York University) he has found striking differences in absolute levels of diaphragmatic electrical activity in obese and obstructive pulmonary disease during chronic hypercapnea. Dr. Julia M. Jones is developing a profile of pulmonary problems peculiar to the Harlem community and, with Drs. Charles Felton and Charles Cherubin, assessing the immediate and late results of treatment of lung abscess. Dr. Felton is directing his attention to an appraisal of the clinical setting and long-term follow-up of patients with necrotizing pneumonia at the Harlem Hospital Center.

Studies of the heart ranged widely. Dr. M. Irene Ferrer collaborated with Drs. Marianne J. Legato and Marcia Bull in an electron microscopic study of human atrial and ventricular myocardium obtained at operation to define subcellular characteristics of myocardial hypertrophy and fibrosis. Drs. Paul J. Cannon, E. Dwyer and Ralph B. Dell (Pediatrics) have devised a method to assess regional myocardial blood flow quantitatively in patients with angina pectoris. Dr. Vincent P. Butler, Jr. has continued studies of antidigoxin antibodies and their application to the clinical problem of digitalis toxicity. Dr. Donald H. Schmidt and Dr. Butler have shown that administration of these antibodies will reverse arrhythmias and other manifestations of toxicity and will prevent death in dogs previously given a lethal dose of digoxin. Working with Dr. Thomas Smith and Dr. Edgar Haber (Massachusetts General Hospital, Boston) a sensitive, specific and rapid radioimmunoassay has been

developed for the clinical determination of serum digoxin levels in patients receiving this drug. Dr. J. Thomas Bigger, Jr. has continued to focus on the electrophysiological effects of cardioactive drugs in isolated profused mammalian cardiac tissues utilizing microelectrode techniques. In collaboration with Dr. William J. Mandel, he has completed studies on the electrophysiological effects of lidocaine on isolated canine Purkinje and ventricular muscle fibers which shows lidocaine, like diphenylhydantoin, to be a member of a new class of antiarrhythmic drugs. Also in conjunction with Dr. Mandel, he has studied the electrophysiological effects of digoxin on the transmembrane voltage characteristics of isolated canine Purkinje and ventricular muscle fibers, as well as on single cells of the isolated rabbit A V node. Further, Drs. Bigger and Mandel have studied the electrophysiological effects of digoxin in the isolated heart tissues and the kinetics of this reaction. With Dr. Conrad C. Jaffe, he studied the effects of bretylium tosylate on the electrophysiological properties of single Purkinje fiber and ventricular muscle fiber cells. In conjunction with Drs. Arthur L. Bassett and Dr. Brian F. Hoffman (Pharmacology) the effects of hypoxia on isolated canine Purkinje fiber cells have been studied with special attention to the alteration in these effects brought about by diphenylhydantoin.

The new Cardiac Monitoring Unit is now actively employed in the course of various investigations of arrhythmias and drug effects. Dr. Robert H. Heissenbuttel, Bigger, and J. J. Coyne are continuing studies on the electrophysiological basis of supraventricular tachycardias in man by recordings from the His bundle in intact awake man in conjunction with programmed atrial stimulation sequences. Drs. Goldreyer, Bigger and Heissenbuttel analyzed the onset and termination (spontaneous and induced) of supraventricular tachycardia in six patients in whom supraventricular tachycardia was apparently initiated and maintained by reentry, utilizing the atrioventricular junction. Drs. Coyne, John O. Burris and Bigger have initiated studies designed to identify the hemodynamic alterations encountered in cardiogenic shock. They have joined Dr. Steven Wotman (Dentistry) and Dr. Vincent Butler in a study to define the possible value of measuring salivary K⁺ concentration and serum digitalis concentration in the diagnosis and management of digitalis toxicity in patients. Work has also continued with Dr. Raymond Bonner (IBM) on the development of computer programs for the interpretation of cardiac arrhythmias in man. As a necessary approach to this methodology, Drs. Daniel I. Wein-

berg and Bigger have the effects of stimulus wave shape on cardiac ventricular excitation threshold under study in the intact anesthetized dog to permit the use of digital computer techniques to process electrophysiological data.

Dr. John Laragh and his group have continued to study hormones and sodium and potassium metabolism in the regulation of fluid metabolism and blood pressure in patients with hypertension or congestive heart failure. Dr. Frank J. Goodwin completed his work as an Eli Lilly Fellow and returned to the London Hospital. Another Eli Lilly Fellow, Dr. Manuel Z. Torres, has returned to Mexico City and Dr. Lawrence Krakoff, an American Heart Research Fellow, has also completed his fellowship with the group. Dr. Hans Brunner from Geneva, Switzerland, and Dr. Richard Bard have joined the group as Visiting Fellows. Dr. Leslie Baer continues as a full-time member of the group. Drs. David J. Gocke, Abbie I. Knowlton and Jay I. Meltzer are part-time participants. In the past year a study has been completed which describes the effects of oral contraceptives in initiating or augmenting high blood pressure and their effects on the hormones of the renin-angiotensin systems. In addition, the effects of ACTH and cortisol on the renin-angiotensin system in man were characterized. In another series of studies a new natriuretic hormone was isolated from human plasma and urine. A new disorder in man called pseudo-primary aldosteronism was also described which is characterized by hypertension, hypokalemia and bilateral adrenal hypersecretion of aldosterone. Dr. Abbie I. Knowlton has collaborated with Dr. Goodwin and Dr. Laragh in showing that the administration of DCA is unable to prevent or diminish the striking rise in renin in rats subjected to rigid sodium restriction. Studies with Dr. Laragh on the water, sodium, potassium and osmolarity of renal tissue in chronic "Goldblatt" hypertension have shown that the papillae and medulla contain less sodium than normal.

Dr. Paul Cannon and his associates have continued to study regional blood flow in the kidneys utilizing inert radioactive gases. Drs. Margaret M. Kilcoyne, Schmidt, Cannon and Burris have performed studies which indicate that alterations of the distribution of intrarenal blood flow accompany renal salt and water retention in experimental models of edema and in patients with congestive heart failure. The influence of norepinephrine, angiotensin II and prostaglandins upon the renal circulation has also been investigated. Drs. Jaime Coelho, K. C. Chien, Sergio Stella (CAPES-Brazil - Fellow) and Bradley are measuring the glomerular size and

filtration rate of single nephrons from different regions of the rat kidney to define the heterogeneity of the nephron population. Using the Hanssen method (ferrocyanide precipitation and microdissection) of measuring nephron transit times, Dr. Coelho and his associates have been successful in devising a method of evaluating peritubular perfusion and interstitial fluid turnover. The effect of arterial hypotension and hypertension upon these parameters is now under study by Drs. Coelho and Bradley. Dr. Chien is continuing to make measurements of nephron dimensions in order to qualify the structural variation within the kidney.

Under the direction of Drs. George Curran, Forrest E. Kendall and Terrence T. Kuske, the lipid laboratory at the Francis Delafield Hospital has set up and standardized a method of lipoprotein electrophoresis and provided this test as a clinical service to the medical center. Dr. Kuske has begun a lipid clinic at the Delafield Hospital to provide a broad base for study of the efficacy of diet and drugs in the treatment of these disorders and for study of the effect of various types of carbohydrates on carbohydrate induced hypertriglyceridemia. A method of measuring glycolipids in a small volume of plasma or tissue has been developed and standardized. Dr. Robert E. Burch has continued studies of acetoacetate production by a newly discovered supernatant acetoacetyl-CoA deacelase which is not affected by fasting, diabetes or the hypocholesterolemic agent, CPIB. Dr. James A. Kennedy has begun to evaluate the role of feedback inhibition as a possible controlling factor in the overall rate of pyrimidine biosynthesis, with special reference to dihydroorotate. Dr. Kennedy is studying the conversion of dihydroorotic acid to orotic acid by rat liver mitochondria by a reaction that appears to proceed via transfer of electrons from substrate to enzyme to cytochrome system.

Research projects dealing with several aspects of the metabolism of vitamin A and of cholesterol have been in progress in the laboratory of Dr. DeWitt S. Goodman. Studies on the plasma transport of vitamin A have been carried out in collaboration with Drs. F. Smith, A. Raz, Y. Muto and Mr. T. Shiratori. Vitamin A circulates in blood bound to a specific protein, retinol-binding protein (RBP), which has been discovered, isolated, and characterized in this laboratory. Using radioactive RBP, the turnover rate of this protein in normal subjects was found to be extremely rapid. A radioimmunoassay has been developed for the measurement of RBP levels in plasma. The effects of nutritional deficiency on RBP levels are being studied

in collaboration with research groups in Iowa City, Cairo, and Guatemala City. RBP levels appear to be abnormal in a number of diseases, and studies have been begun to particularly examine the effects of diseases of the liver, pancreas, and kidneys on the levels and metabolism of RBP. In addition, RBP has very interesting chemical properties, and several physical-chemical studies are in progress dealing with this vitamin A transport system. Studies have been continued in collaboration with Dr. Robert P. Noble on the turnover of plasma cholesterol in man, and on the effects of certain lipid-lowering drugs on cholesterol and lipoprotein metabolism in man.

Dr. Andrew G. Frantz, in collaboration with Dr. Donald A. Holub, has continued studies of human growth hormone secretion and metabolism by continuous 24 hour sampling techniques. Dr. Paul Killian has measured insulin and other metabolic responses to high calorie intravenous amino acid and carbohydrate feeding in surgical patients. Dr. David Kleinberg and Dr. Frantz have developed a highly sensitive *in vitro* bioassay for prolactin, using mouse breast tissue in organ culture, which appears applicable to the measurement of prolactin in human blood. Dr. Alan Robinson is continuing work on a radioimmunoassay for vasopressin and is studying the properties of neurohypophyseal binding proteins for vasopressin and oxytocin. Dr. Richard Himsworth, a MRC Travel Fellow from England, in collaboration with Dr. Peter Carmel (Neurological Surgery) has begun a study of CNS control of growth hormone secretion in the rhesus monkey by means of permanently implanted intrahypothalamic cannulae.

As in the past, studies of thyroid function and disease have occupied a number of workers. Drs. Sidney C. Werner and Ildiko Radichevich have further established the validity of their method for determination of serum triiodothyronine (T3) in collaboration with Drs. J. and A. Nauman of Warsaw, Poland, failing to find any evidence that formation of a methyl ester of T4 falsely raises the T3 levels. Dr. Werner also pursued with Dr. Radichevich an earlier finding that autonomous thyroid nodules may secrete T3 in excess, causing sub-clinical or mild hyperthyroidism not detectable by routine serum thyroxine or PBI determinations which remain normal or are decreased. With Dr. Sunder Bora of Lucknow, India, Dr. Werner has been trying to devise an *in vitro* method for the assay of the circulating long-acting thyroid stimulator (LATS) of Graves' disease that is not affected by contamination by normal human IgG. The response of LATS and antithyroglobulin auto-

antibody, as well as the clinical picture of Graves' disease, by patients to immunosuppressive agents has been under study by Dr. Werner and his associates for the past 4 years. Drs. Donald F. Tapley and John L. Buchanan have studied the effect of thyroxine on an amino acid transport system in rat-liver mitochondria. In collaboration with Dr. Marshall Primack, they have shown that thyroxine stimulates mitochondrial protein synthesis in whole animals before any effect can be detected on ribosomal protein synthesis. Dr. Richard S. Rivlin and his group have demonstrated that hypothyroidism and riboflavin deficiency are similar with respect to three biochemical parameters: hepatic concentrations of FAD, FMN and riboflavin, activities of a number of flavoprotein enzymes, and hepatic activities of several enzymes involved in biosynthesis and degradation of FMN and FAD. Clinical studies of amino acid metabolism performed by Dr. Ralph Bellanger and Dr. Rivlin have shown that plasma levels of tyrosine and glutamic acid probably do not undergo major shifts in their diurnal variation in hyperthyroidism. Dr. Henry Aranow, Jr. has continued the study of the ophthalmopathy associated with thyroid disease in identical twins, in one of whom treatment of thyrotoxicosis with radioactive iodine was followed by severe eye changes, while in the other, no eye signs or symptoms have followed cautious control of the thyrotoxicity with antithyroid drugs.

In other endocrinologic investigations, Dr. Robert E. Canfield has discovered that human chorionic gonadotropin is composed of two polypeptide sub-units which by amino acid analysis appear to resemble the subunits of human luteinizing hormone suggesting that these two hormones have evolved from the same ancestral gene. The study of the complete primary structure of human chorionic gonadotropin has commenced in collaboration with Dr. Frank Morgan, Visiting Fellow from Australia. In collaboration with Dr. Sandra Kammerman, Dr. Canfield has shown that the newly discovered hormone, calcitonin, has a modest but demonstrable effect in lowering serum calcium of patients with hypercalcemia. In addition, two patients with Paget's disease have also been treated with porcine calcitonin and the results indicate that this hormone will at least partially arrest this disease process. Dr. John Loeb has shown that DNA polymerase activity of liver is correlated with animal age, and that as rats become older and the proportional rate of liver growth decreases there is a concomitant fall in polymerase activity. In an investigation of a possible mechanism for the decrease in DNA syn-

thesis produced by treatment of growing rats with cortisone, he has found that cortisone results in a reduction of the DNA polymerase activity in the liver to 50% within 24 hours and to less than 20% of control after 3 days of treatment in association with hypertrophy rather than hyperplasia. In collaboration with Dr. Daniel Kimberg, Dr. Loeb has been investigating the tendency for mitochondria from livers of cortisone-treated rats to sediment 40% faster in sucrose density gradients than control, apparently because there is an increase in the average quantity of non-diffusible material contained per mitochondrion in addition to a 3 or 4 fold increase in mitochondrial size. Dr. Hans W. Neuberg has continued to work on the effects of dietary composition, control, age and obesity on the vascular complications of patients with diabetes mellitus.

In the Edward Daniels Faulkner Arthritis Clinic, Dr. Charles L. Christian has collaborated with Dr. Paul E. Phillips, Dr. Paul D. Ellner (Microbiology), in microbiologic studies of the collagen diseases with the isolation of both viruses and mycoplasma in tissue cultures from patients with these diseases. Studies of biological properties of antigen-antibody complexes by Drs. Robert W. Lightfoot, Jr. and Christian have demonstrated that the size of immune complexes correlates with clearance *in vivo*, complement inactivation and reactivity with anti-gamma globulin factors. Identification of immune complexes in sera of patients with systemic lupus erythematosus (SLE) by Drs. Christian and Stafano Bombardieri by means of an immunoassay of IgG globulin shows variable amounts of large soluble complexes containing IgG present in sera from active cases with a decrease subsequent to remission. Marked heterogeneity of anti-DNA antibodies in SLE patients was noted in studies by Drs. Graham R. V. Hughe and Selwyn A. Cohen indicating a rapid disappearance of precipitating antibodies reactive with native DNA following corticosteroid therapy. Serologic studies by Dr. Phillips have shown an increased level of measles antibody in systemic lupus erythematosus. In collaboration with Dr. Lawrence J. Kagan, he is making an *in vitro* study of chicken gene activation by human cells. Dr. Kagan has concentrated his efforts upon the demonstration that myoglobin synthesis in muscle occurs on polyribosomes (tetrameric to hexameric size) in embryonic and adult muscle minces. Dr. Kagan is also using the immunoassay technique to identify myoglobin in renal tubular lumina and cells or in the urine of patients with myoglobinuria. Dr. E. Carwile LeRoy has continued to develop

antibodies to human collagen components for use as metabolic and structural probes. In collaboration with Drs. Paul Cannon and John A. Downey (Rehabilitation Medicine) he has found that skin blood flow (Xenon isotopic clearance techniques) is diminished in scleroderma. Drs. LeRoy, George Wilner (Pathology) and H. L. Nossel are extending their work on platelet aggregation by collagen preparations. Drs. Anne Briscoe and Charles A. Ragan have found high serum concentrations of arginine and an increase in total serum amino acids in patients with rheumatoid arthritis.

New chapters have been written during the past year in the department's long history of investigation into the causes and manifestations of infectious disease. Drs. David Gocke, Neil Kavey and Harry Greenberg have been responsible for the first clinical application of the gel immunodiffusion method for detecting viral hepatitis antigen in the blood of patients with the disease and in blood bank blood, finding the antigen in 147 of 17,765 units of donor blood with hepatitis appearing in 22 of 42 recipients of antigen-positive blood. Dr. Gocke is using this approach to refine evaluation of antibody production and to define the role of immune mechanisms in pathogenesis of clinical manifestations. Dr. Harold Neu has been actively engaged in developing an Infectious Disease Consultation Program and has devoted himself to studies of resistance transfer factors in the resistance of Gram negative bacteria to penicillin. He has been successful in purifying the penicillinases of various Enterobacteriaceae and for the first time has clearly characterized the enzymes involved. With Drs. C. Cherubin and E. B. Winshell he has studied the antibiotic resistance of *Salmonella* encountered in the Northeastern United States and the bacteriologic effects of various penicillins against *Pseudomonas* organisms. Drs. Neu and John Ultmann (University of Chicago) have pursued an appraisal of the similarities between toxoplasmosis and lymphomata. While at the Imperial Cancer Research Fund, London, England, Dr. Jane Morse studied the localization of ferritin-labelled antibodies to the human complement components C'1q, C'4 and C'3 to see if they localized near the lesions of "holes" produced by the action of complement on sensitized red cells and bacteria. Also using high resolution electron microscopy in collaboration with Dr. Stephen Morse, two ultrastructural particles found in culture supernatants of *Bordetella Pertussis* were separated by cesium chloride gradients with the concomitant localization of the biological activities of lymphocytosis, histamine sensitization and he-

magglutination to only one of these two particles. A research program for the study of inflammation is being set up in the laboratory of Dr. David McConnell. Particular attention will be directed toward the plasma enzymes involved in kinin release and their inhibitors. Dr. McConnell spent the last year as a postdoctoral fellow of the National Institute of Allergy and Infectious Disease in the laboratory of Professor Sir Ashley Miles at the Lister Institute in London, England. In collaboration with Miss Brenda Mason, a procedure was developed for the isolation of human plasma prekallikrein, an enzyme involved in kinin release. Preliminary studies on the activation of this enzyme were carried out.

Various areas of interest in gastroenterology have been explored by a number of the staff. Hepatic dysfunction in experimental canine viral hepatitis have been further evaluated by Drs. Thomas Q. Morris, Gocke, Veronika Macerol (University of Belgrade) and Bradley. Drs. Morris and Macerol have examined the ability of the liver to form bile in puppies with hepatitis. Adult dogs, fitted with Thomas cannulae so that bile can be collected directly without anesthesia or trauma, have been employed by Dr. Morris and his associates to define the role of substances other than bile salts that determine the flow-rate and composition of bile. Drs. Macerol and Morris have discovered that hydrocortisone produces such a response independently of the establishment of a plasma-bile osmotic gradient and dependent upon a system which Bromsulfalein appears to affect. Mrs. Katherine J. Baker and Dr. Morris have confirmed earlier work showing that plasma proteins enter the bile and with new methodology are finding evidence of much larger losses than expected. The possibility of specific protein secretion (secretory IgA) is under investigation. Dr. Charles A. Flood has completed a 10-year study of uncomplicated symptomatic hiatus hernia under medical management. In collaboration with Drs. Harold Barker (Surgery) and Zachariah Dische (Biochemistry) he has assessed the control of gastric mucoprotein secretion, including the effect of autonomic and topical stimulation. With Dr. Edmund N. Goodman (Surgery) he has continued an investigation of the impact of various diseases upon motility and changes in the electrical potential in the esophagus. With Drs. Charles Gerson and Naveed Siddiqi, Dr. John Lindenbaum has studied the recovery of small intestinal absorptive function and mucosal morphology in Americans and Pakistanis previously resident in the tropics. Dr. Lindenbaum has investigated the effects of folic acid and vitamin B₁₂ deficiency on intestinal absorption. With

Dr. Charles Lieber (Mt. Sinai School of Medicine), Dr. Lindenbaum has found that the administration of ethanol to human volunteers along with high protein and vitamin intake induces bone marrow cell changes and ultrastructural abnormalities in the jejunum and ileum. Dr. Lindenbaum reviewed the records of 60 pregnant patients with acute cholera studied in Pakistan and found a 50% incidence of fetal death in third trimester cholera, which was associated with significantly greater diarrhea and dehydration than in second trimester and nonpregnant controls. Dr. Joseph G. Sweeting has continued work on the interrelationships of pancreatic function, upper intestinal hormones and alcohol.

Dr. I. Bernard Weinstein and his group have studied the role of transfer RNA (tRNA) in the regulation of protein synthesis. Employing a variety of chromatographic techniques, an extensive profile of the tRNA population present in normal rat liver has been obtained to clarify the patterns of degeneracy and redundancy in codon recognition. The phenylalanine tRNA of rat liver has been purified to homogeneity and found to contain an unusual fluorescent nucleoside. In collaboration with Drs. Baliga, Borek and Srinivasan (Biochemistry) it was found that the tRNA population of the Novikoff hepatoma is markedly different from that of normal rat liver. Evidence has been obtained that at least two hepatic carcinogens, ethionine and N-2-acetylaminofluorene (AAF), react *in vivo* preferentially with rat liver tRNA apparently producing selective modifications in the amino acid acceptance, codon recognition and chromatographic behavior of specific tRNAs. These results raise the possibility that the critical target for certain chemical carcinogens may be "extragenic." Dr. Richard Rivlin and his associates have demonstrated that enzymic induction by thyroid hormone is not demonstrable in the Novikoff hepatoma, is diminished but present in the Morris hepatoma No. 7800, and is unimpaired in the liver of rats bearing either tumor. By comparing the rate of decrease of FAB concentrations of tumor and liver from riboflavin deficient rats, these workers have documented the resistance of neoplastic tissue to vitamin deprivation. Further studies in retinoblastoma have been carried out in the last year by Dr. F. David Kitchin; humoral antibody production from the soluble fraction of retinoblastoma cells; transformation of lymphocytes by this antigen; *in vitro* culture of retinoblastoma; electron microscopy of retinoblastomas before and after irradiation and after short term culture; pedigree studies and a study of the biological fitness in an unselected series of patients. In addition the

two main phenotypes of human serum Group specific component have been purified and the molecular weight determined. Pathologic studies of polycythemia, ovarian neoplasia, and brain tumors are being made by Dr. George Hyman. Dr. Robert DeBellis is continuing his studies of systems enabling the *in vitro* synthesis of either DNA or RNA utilizing intact liver nuclei. These systems are being used to study the effects of cytoplasmic factors in nucleic acid synthesis as well as to study the mechanisms of action of both hormones and chemotherapeutic agents.

At Mary Imogene Bassett Hospital:

Drs. Laura Krejci, Bonnie Rubin and Malcolm Page have been able to isolate mesosomes from meningococcal L-forms. The L-form of meningococcus first isolated by Dr. Page and Miss Marjorie Bohnoff has been shown to be a more potent immunizing agent than its bacterial form and is currently undergoing field trial by the U. S. Navy. Dr. Joseph Lunn and Dr. Page are typing all isolates of pneumococci from patients with pneumonia in order to begin a study of pneumococcal vaccination in aged or debilitated patients. A 10-year review of the course of patients with chronic lymphatic leukemia treated expectantly by Dr. Emery Herman has compared favorably with a series of patients treated aggressively with chemotherapy at the time of diagnosis. Esophageal manometry with reference to the gastroesophageal junction in patients with hiatal hernia is the main research focus of Dr. John S. Davis.

At Roosevelt Hospital:

Dr. Nicholas P. Christy has completed work with Dr. Joyce C. Shaver on the effect of growth hormone on hepatic function in dogs. He has been associated with Drs. William Rosner and William G. Kelly in a study of estrogen-binding proteins of human serum. With Dr. Kelly and Drs. A. H. Janoski and M. S. Roginsky, an investigation has been completed of the possible role of secreted 16-hydroxylated steroids in the salt-losing defect characteristic of certain patients with congenital adrenal hyperplasia. With Dr. Harvey Benovitz, Dr. Christy continued his studies of an abnormal adrenocorticotrophin in plasma of patients with Cushing's disease.

In the field of cardiovascular disease, Dr. A. Gregory Jameson has continued to work on the determination of the instantaneous velocity of flow in the aorta. A study of electrocardiographic changes during surgery in 100 patients has been

completed by Dr. Charles A. Bertrand. Drs. E. Dwyer, Pinkernell and Fringer are studying, by cine angiography, the pressure-volume or compliance relationship in the left ventricle during angina. Dr. Marianne J. Legato is investigating the mechanism of excitation-contraction coupling in cells without a transverse tubular system, using original methods for marking calcium in situ for electron microscopic localization.

Dr. H. J. Weiss has continued work on patients with qualitative platelet defects and has performed extensive studies on a family in whom a defect in the release of adenosine diphosphate appears to have been transmitted as an autosomal dominant trait through three generations. Studies with S. Koehwa (Mt. Sinai) on the sedimentation properties of antihemophilic factor in plasma have shown that it appears to exist as a high molecular weight polymer whose sub-units are released after thrombin activation or treatment with high salt concentration. Dr. Louise L. Phillips has devoted particular attention to clotting defects in lupus erythematosus. In collaboration with Drs. Priebe and Healey (Surgery), coagulation and fibrinolytic determinations have been performed serially on dogs who have been subjected to extensive cryosurgery of the liver. Dr. Gerald B. Phillips has carried out experiments on the fruit fly which show significant changes in lipid composition with aging. He has also characterized a hemolytic factor of cobra venom which appears to require serum complement for its activity and showed that it is not a phospholipase A, contrary to others.

Dr. Richard Ames, together with Drs. Robert Rubin of Montefiore Hospital and Dan Moore of the Institute of Medical Research have identified a virus in a murine brain tumor as the mammary tumor agent. The role of the virus is presently under study. Dr. Ames is also attempting to define changes in renal tubular fine structure in various states of saline diuresis in the rat in a collaborative study with Dr. Norman Bank of New York University.

At St. Luke's Hospital:

Dr. Theodore B. Van Itallie, while on sabbatical leave at The American University of Beirut, studied the glucose potential of odd carbon fatty acids in rats subjected to prolonged starvation. In the Nutrition and Metabolism Unit, Drs. Sami A. Hashim, Xavier Pi-Sunyer, and Robert G. Campbell have continued studies of the metabolic and physiologic aspects of odd and even numbered medium chain fatty acids (MCFA). In the Gastrointestinal Division, Drs. S. B. Clark and P. R. Holt have de-

veloped techniques for the study of fatty acid diffusion kinetics in the intestinal mucosa of the rat and have demonstrated that intramucosal esterification may be rate limiting for diffusion *in vitro*.

Dr. E. Mezey and Holt demonstrated competitive inhibition of alcohol for retinol oxidation by alcohol dehydrogenase in human liver. Dr. J. B. Weiss, working with Dr. R. McCray, has found that multiple direct-vision biopsies of gastric ulcers greatly help in the early diagnosis of carcinoma and may avoid unnecessary surgery in benign lesions. Drs. M. Gang, T. Ekkers and McCray have also demonstrated the clinical usefulness of early fiberoptic esophago-gastrectomy in the management of patients with upper gastrointestinal bleeding in a general hospital.

Dr. Robert B. Case and Dr. Colin McCord (Surgery) continued an investigation of myocardial metabolism during ischemia, finding that free fatty acid and oxygen uptake persists to the point of rigor. Investigations of diazoxide therapy for hypertension, vectocardiograms of LBBB, the clinical syndrome of isolated right ventricular failure in myocardial infection, and ventricular rupture have occupied Dr. Myles J. Schwartz in collaboration with Drs. R. Landesman, E. Williams, E. Santilli and John Morse. In the Cardiopulmonary Laboratory, under the direction of Dr. A. L. L. Bell, Drs. V. Krstulovic and L. W. Swift are studying carbon monoxide diffusion capacity in asthma and chronic bronchitis; Drs. S. Shimomura and A. A. C. Cameron are using cineradiographic techniques to evaluate ventricular function and Dr. C. R. Barrett, Jr. has analyzed experience with intubation. Drs. Michael Grieco and Richard Pierson, Jr. have found that pulmonary blood volume is increased in asthmatics with isoproterenols.

In the Renal-Endocrine Laboratory, Drs. James G. Hilton and Paul Cushman, Jr. have studied the effect of chronic methadone administration on some hypothalamic-pituitary-adrenal parameters in a group of 16 heroin addicts. With Dr. Richard N. Pierson, Jr., Dr. Hilton has used the whole body K⁴⁰ counting to establish a normal reference standard for body potassium in 1500 normal individuals. Dr. Hilton and Dr. William G. Kelly have found that 16 OH progesterone is natriuretic when infused into normal volunteers and in one patient with Addison's disease.

Dr. John F. Bertles, collaborating with Dr. Shu Chien (Physiology) has detected an abnormally increased viscosity of oxygenated blood in sickle-cell anemia that is attributable to permanently deformed red cells (irreversibly "sickled" cells). Work on

the biochemical genetics of narrow stem cell commitment is proceeding in collaboration with Dr. Geoffrey L. Zubay, Biological Sciences, Columbia University; and work recently completed in collaboration with Dr. Albert S. Gordon, New York University, has confirmed that mammalian marrow stem cells are characteristically lymphoid.

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Microbiology

HARRY M. ROSE

Borne Professor and Chairman of the Department

Attending Microbiologist and Associate Attending Physician

Dr. Beatrice Carrier Seegal retired after a long and distinguished career of service to the department and the Medical Center. Among her many important scientific contributions she is best known for her pioneering studies of immunologic reactions as the cause of cardiac and renal disease, for which she achieved international recognition. Her contributions as a gifted teacher, a wise counselor and a notably compassionate personality are remembered with admiration and respect.

Drs. Konrad C. Hsu and Herbert S. Rosenkranz were promoted to Professor. Dr. Donald H. Harter was promoted to Associate Professor of Neurology (Microbiology). Dr. Gabriel C. Godman was appointed Professor of Pathology, but also retained his title as Professor of Microbiology. Dr. Arline D. Deitch was appointed Assistant Professor of Pathology (Microbiology). Drs. Jacob A. Donkersloot, Angus C. Sampath and David Senitzer received appointments as Research Associate. Miss Louise Goode was appointed Assistant.

Resignations were tendered by Drs. Satish C. Agarwal, Michael D. Katz, Shoichi Nakajima, Helen S. Rappaport and John Swanson.

Postdoctoral fellowships were completed by the following persons: Dr. Marilynn Etzler, Dr. Sten G. Hammarström, Dr. Kancatsu Miyamoto and Dr. Azra Shahidi.

The following new postdoctoral fellows and trainees were appointed: Dr. Joseph Bieth, Hospices

Civils de Strasbourg, Strasbourg, France; Dr. Rose R. Feiner, Associate Professor of Biology, The City College, The City University of New York; Dr. Karl A. Lundblad, University of Uppsala, Sweden; Dr. Doreen S. P. Liebeskind; Dr. Halina Szafran, Institute of Pediatrics, Cracow School of Medicine, Poland; and Dr. Benedict L. Wasilauskas.

Drs. Byron E. Anderson and William G. Merz (Dermatology) were reappointed as postdoctoral fellows. Dr. Edward D. O'Donnell was reappointed as a trainee in clinical microbiology.

Fourteen predoctoral students were in residence, of whom one received the Ph.D. degree and one was awarded the M.A. degree.

Drs. Myles M. Behrens, David H. Brown, Mahlon V. Freeman, Ian Nisonson and Albert T. York, Jr. were enrolled as candidates for the Med.Sc.D. degree.

Dr. Rose continued his studies at Fort Dix on the etiology and epidemiology of viral infections of the respiratory tract. He also continued studies of virus-host cell relationships in collaboration with Drs. Calderon Howe, Hsu, Councilman Morgan and Rosenkranz. Dr. Rose presented a paper on factors concerned with immunity to influenza in man at the working conference on myxovirus infections, which was held in Tokyo under the sponsorship of the Japan-United States Cooperative Medical Science Program.

The immunochemical laboratories under Dr. El-

vin A. Kabat are operated jointly under the Departments of Microbiology, Neurology, and Human Genetics and Development. Dr. Marianne M. Dorner and Dr. Kabat, together with Dr. William J. Yount (Rockefeller University), carried out an extensive study of the behavior of heavy and light chains of various human antibodies in comparison with various myeloma globulins. Dr. Carlos Moreno and Dr. Kabat studied human anti-A purified by absorption on insoluble polyacetyl blood group A substance. Work was actively pursued on the purification and characterization of plant hemagglutinins (lectins) from *Dolichos biflorus* seeds (Dr. Etzler) and of hemagglutinin from the albumin gland of the snail (Dr. Hammarström). Another major area of investigation was the chemistry of the blood group A, B, H, Le^a and Le^b substances. Dr. Kenneth O. Lloyd (Dermatology) and Dr. Kabat were able to propose an over-all structure for the blood group substances from secretions which permits all of the genetic steps thus far recognized in the biosynthesis of these substances and have called attention to a new gene which must be involved in the system. Drs. Lloyd, Sherman Beychok (Chemistry and Biological Sciences) and Kabat fractionated blood group A substance from hog gastric mucin by precipitation with lectin from the jack bean, concanavalin A, which led to the recognition of a new determinant in blood group substances from hog and human stomach. Drs. Giuseppe Vieari and Kabat studied the blood group substance from an ovarian cyst fluid which lacks blood group A, B, H, Le^a and Le^b specificity and appears to be a precursor type substance. Drs. Anderson and Kabat continued to investigate the alkaline borohydride degradation of blood group substances in an attempt to obtain larger oligosaccharide fragments and to develop methods for identifying the linkages of methylated hexosamines in oligosaccharides. Drs. Anderson and Flavio G. Gruezo examined purified oligosaccharides obtained by mild acid hydrolysis of blood group substances with a view to determining their structure. Mr. Walter Newman, a graduate student in chemical biology, and Dr. Kabat studied the blood group substances from horse gastric mucosa. Drs. Lloyd, Beychok and Kabat continued their systematic studies on the optical rotatory dispersion and circular dichroism of oligosaccharides and polysaccharides containing amino sugars. Dr. Valee Harisdangkul, a graduate student, and Dr. Kabat studied the binding of oligosaccharide flavazoles of dextran with human antibodies by fluorescence quenching as a way of probing the antibody combining site. They also studied proteins

of shark serum in collaboration with Dr. M. Michael Sigel, University of Miami. Drs. Sigrid Svensson, Hammarström and Kabat studied the dissociation of various hemagglutinin-polysaccharide and antibody-polysaccharide systems by borate and were able to use this procedure to fractionate a dextran-type II antipneumococcal specific precipitate. Drs. Lundblad and Kabat began a comparison of blood group oligosaccharides previously isolated from urine by Dr. Lundblad. Dr. Brown undertook immunologic studies of visceral larva migrans. Miss Iris D. Sierra continued work on the immunochemical determination of γ G immunoglobulin in cerebrospinal fluid. Dr. Kabat is serving on the National Research Council Committee on Plasma and Plasma Substitutes, is Chairman of the National Academy of Sciences Committee on Latimeria, and is a member of the National Science Foundation's Molecular Biology Panel. He delivered the opening address to the International Congress of Clinical Pathology in Montreal, the Jules Freund Memorial Lecture at the National Institutes of Health, and spoke to the Chilean Microbiology and Hematology Societies in Santiago, Chile. He attended conferences on East Coast Fever and Trypanosomiasis sponsored by the Rockefeller Foundation in Bellagio, Italy, on developmental aspects of the antibody response in Prague, and on evolution of the antibody response at the Argonne National Laboratory; he also participated in the Sixth Annual Pathobiology conference at Aspen, Colorado, and taught at the World Health Organization Centers for Research and Training in Immunology at São Paulo, Brazil, and Mexico City. He was appointed chairman of a World Health Organization panel on nomenclature of immunoglobulins, and was elected Membre Correspondant Etranger of the Société de Biologie in Paris. He is an associate editor of the *Journal of Immunology* and serves on the Scientific Committee of the New York Blood Center.

Dr. Howe, while on sabbatical leave, continued his studies of purified erythrocytic mucoid, which bears virus receptors and blood group antigens. The receptor mucoid, and proteins lacking polysaccharide and receptor activity, are regarded as species-specific antigens that contribute to the structural integrity of the plasma membrane. The interactions of myxoviruses with hemoglobin-free erythrocyte membranes (human, simian, murine) and with purified receptor mucoid were examined by immunochemical methods. Electron microscopy, with the aid of labeled antibody to purified mucoid, yielded information on the distribution of reactive sites on erythrocyte membranes. This latter part of the work

was done at the University of Rome, in the laboratory of Dr. Giuseppe A. Andres, and in collaboration with Dr. F. Minio and Miss H. Spiele. It was presented at the Franco-Swiss Electron Microscopy Colloquium in May, 1969, at Lausanne, Switzerland. Quantitative immunochemical studies of host-derived viral components, including a sulfated mucopolysaccharide (host factor, HF) that forms part of the influenza virus hemagglutinin, were completed. Dr. Howe presented papers at the First International Congress for Virology, Helsinki, and at the Eighth Annual Meeting of the American Society for Cell Biology, Boston. He also lectured at the Istituto Superiore di Sanita, Rome.

Dr. Morgan, in association with Drs. Rose, Howe and Rosenkranz, studied the mechanisms whereby viruses enter cells to cause infection. The envelopes (coats) of herpes simplex, influenza and parainfluenza viruses were found to fuse with the surface of the cell, thus permitting passage of the viral contents directly into the cytoplasm. Adenovirus, on the other hand, appeared to remain intact on entry and to be uncoated in the cytoplasm; in proximity to the nuclear membrane the virus ruptured with release of nucleoprotein into the nucleus.

Dr. Sam M. Beiser continued his immunochemical investigation of nucleic acids in collaboration with Dr. Bernard F. Erlanger. Several minor purine and pyrimidine bases were coupled to proteins; the conjugates were antigenic in rabbits and elicited antibodies that were strictly specific for the immunizing antigen. The specific antisera are now being studied to determine whether they can detect minor bases in DNA. In collaboration with Dr. Szafran, a method for purifying specific antibodies was developed, using an insoluble immunoabsorbent that is prepared by heating conjugates of the hapten with egg albumin. Fluorescein-labeled and ferritin-tagged antinucleoside antibodies were used to demonstrate the presence of denatured DNA in the glomeruli of kidneys from humans with lupus nephritis. Similar results were obtained with kidneys from NZB/NZW F 1 mice, which develop a disease whose symptoms are similar to those seen in patients with disseminated lupus erythematosus. In collaboration with Drs. Hsu, Seegal and Andres, attempts were made to ameliorate the disease by immunizing NZB/NZW F 1 mice with nucleoside-BSA conjugates, with encouraging preliminary results. Together with Drs. Swanson and Anna Galis, ferritin-labeled antibody specific for competent (transformable) pneumococci was used in an attempt to visualize the "receptor sites" on the organisms, which

were found to possess a limited number of such "receptor sites."

Dr. Erlanger, in collaboration with Dr. Spyros M. Vratsanos, Mr. Norbert H. Wassermann and Mrs. Anne G. Cooper, extended his studies of the amino acid sequence at the active site of pepsin. In association with Dr. Bieth, work was continued on model systems of enzyme photo-regulation in which the control agent is a light-sensitive low molecular weight ligand, and using these systems it was possible to control the activity of chymotrypsin, trypsin and acetylcholinesterase by means of light. Together with Dr. David Nachmansohn (Biochemistry), photoelectric effects were produced with the electroplax system of the electric eel, *Electrophorus electricus*. Studies on the biological, biochemical and immunochemical properties of anti-nucleoside and anti-nucleotide antibodies were extended in collaboration with Drs. Beiser and Susan S. Wallace.

Dr. Stuart W. Tanenbaum extended his studies on the isolation, characterization and biosynthesis of acetate-polymalonate derived antibiotics produced by the higher fungi. In association with Dr. Agarwal, the structure of 6-hydroxyramulosin, a novel metabolite from *Pestalotia ramulosa*, was elucidated. Together with Dr. Katz, an additional form of diphtheria toxin was obtained by extensive purification of the protein from *Corynebacterium diphtheriae* filtrates. The extracellular neuraminidase of *Diplococcus pneumoniae* was crystallized after some 400-fold purification, and in work carried out with Mr. Shaiu Ching Sun, it was shown that the crystalline preparation is composed of several isoenzymes.

In continuing studies on the mode of action of hydroxyurea, Dr. Rosenkranz, using genetic, metabolic, chemical and physicochemical techniques, showed that the primary action of the drug-reversible inhibition of DNA synthesis could be separated from some of the non-specific side-effects such as death of treated cells, degradation of cellular DNA and mutagenic effects. Drs. Mullinix and Rosenkranz investigated the basis of the previously described phenomenon of "reversible bacterial death" and found that apparent death was caused by damage to cellular DNA, which could be repaired efficiently if the bacteria were incubated under conditions permitting active energy metabolism; this repair mechanism was significantly different from normal DNA synthesis. Mr. Martin Zweig, a graduate student, together with Drs. Morgan and Rosenkranz, investigated the regulatory role of DNA synthesis on bacteriophage-induced metabolism and viral morphogenesis. Dr. Rosenkranz began a study to determine the basis of the carcinogenic and carcino-

static action of urea derivatives. Dr. Rosenkranz's Research Career Development Award was renewed for an additional five years. He continued to supervise the predoctoral teaching program in the department.

Drs. Hsu, Seegal and Andres continued to collaborate with Dr. Thomas E. Starzl (University of Colorado), and Dr. Kendrik A. Porter (St. Mary's Hospital, London), in immunopathologic studies of human kidney transplants with fluorescein- and ferritin-labeled antibodies. Renal tissues obtained by biopsy from 265 patients with various nephropathies from the Medical Center, Harlem Hospital, and II Clinica Medica Universita di Roma, Italy, were examined for immunologic reactants responsible for the disease. In association with Dr. Howe, Dr. Hsu studied the course of autoimmune hemolytic anemia in NZB mice. In collaboration with Drs. Morgan, Miyamoto and Berge Hampar (National Cancer Institute), using ferritin-conjugated rabbit 7S and 19S antibodies to herpes simplex virus, Dr. Hsu found that these antibodies react with the different virion antigens in concord with the reactions shown by cross-neutralization tests. Studies with Dr. Hampar using human sera and hyperimmune rabbit antiserum to the herpes type virus (HTV) in Burkitt lymphoma were carried out and indicated that antibodies specific for HYV nucleocapsid antigen occur in some human sera and in rabbit antiserum to partially purified virus, but that there were no cross-reactions with the nucleocapsid antigens of herpes simplex virus, cytomeglovirus or varicella-zoster virus. In conjunction with Drs. Swanson and Emil Gotschlich (Rockefeller University), it was demonstrated, by the immunoferritin technique, that the M antigen of Group A streptococci is located in hair-like fimbriae on the surface of the bacteria; these fimbriae are attached to the mucopeptide layer of the Gram-positive cell wall. Dr. Hsu was appointed Consultant in Microbiology, Veterans Hospital, Montrose, N. Y. He spent two months as Visiting Professor, University of Ulm, West Germany.

Dr. Harry S. Kessler extended his studies on New Zealand mice, which spontaneously develop autoimmune disease. In association with Dr. Wladyslaw J. Manski (Ophthalmology), he carried out detailed histologic studies of the eyes. In collaboration with Dr. Benjamin Panski (Pathology), the pancreas was also found to be involved. Electron microscopic and immunofluorescence studies of pancreatic tissues are in progress.

Dr. Paul D. Ellner continued his work on the Arthritis Project in collaboration with Dr. Charles L. Christian (Medicine), in which attempts were made to ascertain, by cultural techniques, the possible etiologic role of mycoplasma. Dr. Ellner developed a new medium, lactose-lecithin agar, for the isolation of *Clostridia* from clinical specimens. He also continued to study specimens from patients for the presence of *M. pneumoniae*. Dr. Ellner is a member of the Medical Laboratory Service Advisory Committee of the National Communicable Disease Center, Atlanta, Georgia, and of the Board of Examiners of the New York City Department of Health. He was elected Fellow of the American Academy of Microbiology, and member of the Academic Clinical Laboratory Physicians and Scientists. Drs. O'Donnell and Wasilauskas assisted Dr. Ellner as trainees in the program on clinical microbiology. The Diagnostic Laboratory performed a total of 116,450 tests, including 35,650 serologic examinations, which represents an increase of 6% above the preceding year. A number of significant changes in technique were made, including the adoption of the hemagglutination-inhibition test for Rubella virus antibodies, and a test for anti-nuclear antibodies. Improvements were made in the methods for culturing sputum and for isolating and identifying tubercle bacilli. Valuable experience was gained from the computer program, using a program written by a third-year medical student, Mr. Alan E. Zuckerman, for the 1401 computer. A more advanced program is being prepared for the 360-40 computer, with the help of Dr. William A. Bauman (Pediatrics) and the Data Processing Department, which will permit more rapid and efficient operation and better quality control.

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Neurological Surgery

J. LAWRENCE POOL

Professor and Chairman of the Department • Director of Service

The National Institutes of Health training grant awarded to the Department of Neurological Surgery in 1968 has to date underwritten the traineeship of four men associated with our program; in addition it has provided part-time support for two medical students working both clinically and in the laboratory. The two medical students who have been supported to date are Mrs. Larry Norton, who was involved in the Neurosurgical Research Laboratory on the study of cerebral vasospasm, and Mr. Don Quest, who was currently involved in both clinical aspects of the service and the research being carried on in the laboratories.

The department has now well equipped neurosurgical research laboratories, fully capable of carrying out studies on the cerebral vascular system and other experimental work.

A total of 998 surgical procedures were performed during the past year. Of these, 923 were major operations; 517 craniotomies, 324 laminectomies and 82 miscellaneous procedures. In addition, 33 minor operations and 42 diagnostic procedures were performed.

Dr. Pool has continued his studies of cerebral vasospasm, intracranial aneurysms and the application of microsurgery for the removal of acoustic neurinomas and other lesions of the nervous system. With Dr. Peter Carmel he has also initiated an experimental trial of nerve transplantation designed to help paraplegia.

During the year he completed a four year term

as Treasurer of the World Federation of Neurological Societies and was re-elected for the following four years. In addition, he served as Treasurer for the World Congresses of Neurological Sciences, Inc., and was recently appointed a member of the editorial board of the *Bulletin of the New York Academy of Medicine*.

Dr. Edward B. Schlesinger continued work in the isotope laboratory which fortunately was able to return to its much improved and enlarged quarters. Two computers are now in line to the major scanning devices and it has been possible to resume experimental studies and improve clinical and diagnostic opportunities.

Studies of the movement of isotopes in the cerebrospinal fluid pathways have yielded a great deal of useful clinical information, particularly in comprehending low pressure hydrocephalus and a variety of functional blocks to normal cerebrospinal fluid movement.

Scanning instrumentation continues to be a subject of interest and it is gratifying that the general trend throughout the world has been in the direction of our original goal of improved data storage, retrieval, and analysis of scanning information.

With Dr. Stephen Trokel of the Eye Institute, Dr. Schlesinger has developed and published a method of orbital scanning, which has proven clinically useful in separating non-tumorous orbital masses from those necessitating operative intervention.

A study of hydromyelia has been underway with

the use of a battery of studies including spinal cord puncture and attempts at obliteration of the central canal non-operatively. Encouraging clinical results and clarification of the basic pathology have resulted. With the assistance of Dr. Michael S. Tenner (Neuroradiology) and Dr. Jost Michelsen (Neurosurgery), this group of disorders is being redefined.

For some years, with the cooperation of Dr. Milos Basek (Otolaryngology), the usefulness of the transphenoidal approach to basal lesions of the skull has been evaluated. The type of case amenable to such a surgical procedure has become apparent, leading to excellent post-operative results for cystic lesions of the pituitary fossa and lesions invading the sphenoid sinus.

Dr. Jost Michelsen participated in these isotope studies which play a significant role in the comprehension of neurological disorders. Dr. Joseph Thomas of the neurological resident staff has also shown a keen interest in these studies.

Dr. Lester A. Mount has conducted research in spontaneous cerebrospinal fluid rhinorrhea with Dr. Ronald Brisman and Dr. James Hughes and in cerebrospinal fluid rhinorrhea and the empty sella, also with Dr. Brisman and Dr. Hughes. Findings of research on multiple intracranial aneurysms were presented at the Mexican Neurosurgical Congress. Dr. Mount has also studied craniopharyngiomas with Dr. Jost Michelsen and Dr. Justin Renaudin. As a member of the Sub-Committee on Classification and Nomenclature of the Joint Council Subcommittee on Cerebrovascular Disease of the National Institutes of Health, he has conducted research in cerebral vascular disease. He is also continuing his study of the long term results of patients with various types of premature synostosis of sutures of the cranial vault by new operative procedures.

In the past year Dr. Mount was elected Vice-President and member of the Council of the Society of Neurological Surgeons. He was a guest lecturer at the Mexican Congress of Neurosurgery and president of a round table on head injuries. He is Founding member, Vice-President and member of the Board of Trustees of the Foundation for International Education in Neurosurgery and a member of the Neurological Science Research Training Committee A.

Dr. Mount has also been active as a member of the Program Committee for the Fourth International Congress of Neurosurgery and as Chairman of the Movie Committee. His interest in Project

Hope has continued as its Chief of Neurosurgery and member of its Medical Board. In addition he is Chairman of the Hope Committee of the Neurosurgical Society of America. Dr. Mount is also a member of the Executive Faculty of the College of Physicians and Surgeons until July.

Dr. James Correll has continued the project for the study of occlusive cerebral vascular disease, which includes improved diagnostic and surgical techniques. His studies show that ulcerated carotid artery atheromatous plaques is a frequent source of cerebral embolization. In collaboration with Dr. Ernest H. Wood (Neuroradiology) a detailed study of the natural history of atheromatous ulceration has been made involving angiographic diagnosis and the results of operative treatment.

Results of an investigation on the course of recurrent cerebral ischemia following successful surgery was carried out with collaboration of Dr. Frank K. Bochenstein (Neurology) and Dr. Ernest H. Wood (Radiology) and presented to the 9th International Congress of Neurology/4th International Congress of Neurological Surgery, in New York City, September, 1969.

In addition the use of various neuroradiological techniques, including thermography and Doppler ultrasonics for the evaluation of these patients has been evaluated. Recent studies of the accuracy of transcutaneous Doppler ultrasonics in evaluating the blood flow in the extracranial arteries has been made in collaboration with Dr. Donald Brisman and Dr. Bernard L. Grossman (Radiology). Results of this study were presented to the 9th International Congress of Neurology/4th International Congress of Neurological Surgery.

The investigation of the influence of the nervous system on lipid metabolism has been continued by Dr. Correll, leading to more information concerning the autonomic function of the central nervous system. In chronic unanesthetized animals, prepared with implanted cerebral electrodes, electrical stimulation of certain areas of the brain may result in a dramatic change in lipid transportation. Additional knowledge of the effect of the central nervous system on the coagulation of blood, a function heretofore little appreciated, has also been gained.

Dr. Edgar M. Housepian continues his interest in stereotaxic surgery for pain, epilepsy and other dyskinesias. In collaboration with Dr. George Krauthamer (Physiology—Rutgers University), preparations have been made to record the electrical activity of single neurons in patients undergoing stereotaxic surgery. Dr. Housepian has also continued his ac-

tivity with the Medical Data Processing Department which is now generating monthly reports on surgical census, professional activity, complications and infections within the Department of Neurological Surgery. In collaboration with Dr. Arthur Voorhees, (Surgery), and Dr. Charles Ryder (Orthopedic Surgery) work is in progress to join forces to develop a single data input and retrieval system for all surgical services.

Dr. Housepian has continued his interest in the treatment of orbital tumors and with Dr. Steven Trokel (Ophthalmology) has written a chapter for a textbook of Neurosurgery. Dr. Housepian has also headed a group of clinicians and investigators interested in the study of glial brain tumors. It is hoped that this planning will facilitate clinical investigation with chemotherapeutic agents, BCNU and BUDR, and provide material for investigation of mechanisms of replication and the effects of radiotherapy and drugs on tumor growth.

The need for color television in the operating room and in the classroom has been recognized by the Department of Neurosurgery, and Dr. Housepian has worked with others in various departments sharing an interest in this field. He has been able to test applications of color television within the department through the generosity of Fairchild Space and Defense Systems and the International Video Corporation.

Dr. Housepian has participated in a course on microneurosurgery in Montreal, Canada. With Dr. Chu H. Chang (Radiology) he has studied the long-range follow-up patients with medulloblastoma treated with radiotherapy and surgery and presented a report of their findings at the International Congress of Neurological Sciences held in New York. With Dr. Marshall Grode he has reviewed the problem of hemangiopericytoma of the central nervous system. Dr. Housepian reviewed the present status and research trends in the surgical treatment and clinical electrophysiology of Parkinson's Disease for the United States Public Health Service.

Dr. Thomas J. Bridges has continued refining the technique of percutaneous cordotomy. Methods of evaluating the degree of clinical pain and of estimating life expectancy are under exploration. The techniques of cerebral plethysmography in experimental animals are being developed.

Dr. James McMurtry has continued his clinical investigations, with Dr. William Amols, in the medical and surgical approach to patients with trigeminal neuralgia. He has completed a surgical re-

view book for neurological surgery, to be published in early 1970.

Dr. McMurtry has begun work in the laboratory of Dr. Schlesinger on some problems in the radioisotope measurement of cerebral blood flow.

Dr. Bennett M. Stein is a full-time attending surgeon on the Pediatric Neurosurgical Service with special interest in developing a long-term prospective study of the shunted hydrocephalic child in conjunction with Doctors Carter, Brisman and Fishman. He is also involved in the review and compilation of long-term follow-up of the treatment of posterior fossa cystic astrocytomas and an evaluation of postoperative shunting in such cases.

His research work includes an on-going project in conjunction with Dr. Malcolm Carpenter (Anatomy) on the study of connections from the vestibular ganglion to the cerebellum. Other research includes work on the study of cerebral vasospasm in conjunction with Drs. Pool, Barrett and Fraser in the neurosurgical research laboratory. The work on cerebral vasospasm with Dr. Pool and Dr. Fraser was presented at the International Congress of the Neurological Surgeons meeting in New York in September, 1969. Currently, he is engaged in a second project on the study of histological changes following prolonged hyperventilation, in conjunction with Dr. Sara Luse, Dr. Fraser and Dr. Gissen. Recently he has become a member of a committee to set up a society of pediatric neurological surgery.

Dr. Peter Carmel has been active in the increased affiliation with Harlem Hospital, and the upgrading of the service there. A full teaching program for rotating surgical residents has been established at the Harlem Hospital under Dr. Carmel, with active support in both teaching and patient care from Drs. Richter, Brust and Koenigsberger of the Department of Neurology.

Dr. Carmel has also established a new laboratory for the study of hypothalamic control of ovarian function in cooperation with Dr. R. Vande Wiele (Obstetrics and Gynecology). Studies of distribution of monoamines in the hypothalamus are in progress, jointly with Dr. Robert Barrett (Neurology). This work is supported by the Institute for the Study of Human Reproduction. Studies of the efferent projection of the VA thalamic nucleus, carried out in Dr. Malcolm Carpenter's laboratory, have been completed. This work has been submitted as partial requirement for the Doctor of Medical Science degree.

Dr. Wolfgang Jost Michelsen is working in the Radiology laboratory with Dr. Sadek Hilal, attempting to work out techniques for clotting experimental aneurysms and arteriovenous malformations using the POD catheter. A new miniature pressure transducer has been developed which will be used to measure cerebral venous sinus pressures in intracranial pathology.

Dr. Michelsen is continuing to study cerebrospinal fluid dynamics with Dr. Edward B. Schlesinger in the Radioisotope laboratory. In conjunction with Dr. Lester Mount and Dr. Justin Renaudin, 135 cases of craniopharyngioma are being studied and reported on.

Dr. Richard A. R. Fraser is currently involved in research on cerebral vasospasm in the laboratory. This work is being supported in part by the New York Heart Association. Results of this work were presented at the International Congress of Neurological Surgeons. He is also involved with the Department of Anesthesiology on the study of effects of prolonged hyperventilation.

Residents Activities

Dr. Edward F. Downing has been appointed

Academic Registrar, Senior House Officer grade, at The National Hospitals for Nervous Diseases, Queen Square and Maida Vale, London, England for the period January 1, 1970 to June 30, 1970. He will be engaged in clinical research on cervical spine and cerebrovascular disorders with Professor Valentine Logue. This year Dr. Downing has been conducting clinical research with Dr. James McMurtry on toxoplasmosis and aqueductal stenosis.

Dr. Marshall Grode organized the New York Neurosurgical Resident's Society, for the purpose of holding meetings (four to six times a year) to discuss clinical and experimental projects and problems. These meetings are held in rotation at the various neurosurgical training centers and presentation of papers is made entirely by residents. A paper of *Hemangiopericytoma of the CNS* will be presented by Dr. Grode at the next meeting of the Neurosurgical Resident's Society.

Dr. James Hughes is presently working on a Neuro-radiology teaching aid ruler.

Dr. James Finn has been working on the problem of galactorrhea in pituitary tumors.

1969 Publications

Neurological Surgery

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Brisman, Ronald and Chutorian, A. M.

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Brisman, Ronald; Correll, James W. and Grossman, B. L.

Transcutaneous doppler and extracranial carotid disease, abstract. *Excerpta Medica International Congress Series No. 193*, 1969.

Carmel, Peter W. and Markesberry, W. R.

Arnold-Chiari malformation in an elderly woman. *Arch Neurol.* 21:258-263, 1969.

Carmel, Peter W. and Stein, Bennett M.

Sensory ganglion cell changes following proximal and distal nerve section. *J. Comp. Neurol.* 135:145-166, 1969.

Chang, C. H.; Housepian, E. M. and Herbert, C. An operative staging system and a megavoltage radiotherapeutic technique for cerebellar medulloblastoma. *Radiology* 93:1969.

Correll, James W.

Increase in lipemia due to cerebral activity. Abstract published for program of the 4th International Congress of Neurological Surgery.

Correll, James W.

Increase in plasma turbidity as a result of cerebral stimulation. *Nature, Internat. J. of Science*: Vol. 223:415-416, July 26, 1969.

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Recurrent cerebral ischemia following successful surgery on the extracranial arteries. Abstract published for program of the 4th International Congress of Neurological Surgery.

Driller, J.; Hilal, S. K.; Michelsen, W. J.; Katz, L. and Konig, W.

Development and use of the POD catheter in the cerebral vascular system. *Medical Research Engineering* 11-16, August 1969.

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Experimental vasospasm: induction, pharmacology

and catecholamine morphology in the laboratory animal. *Excerpta Medica* 193:77, 1969.

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Elective circulatory arrest during neurosurgery for basilar artery aneurysms. *J.A.M.A.* 207:7:1315-1318, 1969

Housepian, Edgar M.

Clinical aspects of parkinson's disease; surgical treatment and clinical electrophysiology from parkinson's disease. Present status and research trends, Public Health Service Publication, No. 1491, 1968.

Surgical treatment of unilateral optic nerve gliomas. *J. Neurosurg.* 31:604-607, 1969.

McMurtry, James G.

The history of medical and surgical interests in facial pain. *Headache* 9:1, 1969.

Penn, Richard D. and Hagins, W. A.

Signal transmission along retinal rods and the origin of the electroretinographic a-wave. *Nature*: Vol. 223, 5202:201-205, 1969.

Schlesinger, Edward B.; Trokel, Stephen L. and Bailey, Sheila

Radioactive scanning in the analysis of unilateral exophthalmos. *Transactions, American Academy of Ophthalmology and Otolaryngology*: Vol. 73, 5:1005-1012, 1969.

Wood, Ernest H. and Correll, James W.

Carotid atheromatous ulceration: its natural history, angiographic diagnosis and the results of operative treatment. Abstract published for programs of the Combined Meeting of American Society of Neurological Surgeons, Cleveland, 1969.

Neurology

RICHARD L. MASLAND

Professor and Chairman of the Department • Director of Service

Teaching

a. Changes in Staff

During the year, members of the Department of Neurology have received important recognition in national societies. Dr. Melvin D. Yahr was elected President of the American Neurological Association and completed his duties as Secretary-General of the Ninth International Congress of Neurology. He was an invited lecturer at the spring meeting of the Danish Neurological Society, The Society for Biological Research at Gotesberg, Sweden, The Karolinska Institute in Stockholm, Sweden and the University of Oslo, Norway. Dr. Yahr also received The Gold Plate Award of the American Academy of Achievement.

Dr. Sidney Carter is President of the American Academy of Neurology.

Dr. Eli S. Goldensohn was appointed Visiting Professor of Medicine (Neurology) at Baylor University in March 1969 and was elected to the Councils of the American EEG Society and the American Epilepsy Society.

Dr. Arnold P. Friedman received the Rush Silver Award for the exhibit on chronic recurrent headache, presented at the annual meeting of the American Psychiatric Association in May 1969. Dr. Friedman delivered the Sandoz Memorial Lecture on the infinite variety of migraine, at the Third International Migraine Symposium of the Migraine Trust, National Hospital, London, England, April 1969.

Dr. Friedman is Director, American Board of Psychiatry and Neurology.

Dr. Abner Wolf has been appointed a Vice-President of the 1970 International Congress of Neuropathology and a member of the Executive Committee of the International Society of Neuropathologists.

Dr. Philip E. Duffy received the Joseph Mather Smith Prize for 1969, awarded annually to a graduate of the College of Physicians and Surgeons whose research work is deemed outstanding.

Dr. Harry Grundfest gave a series of lectures at the Hebrew University, Tel Aviv University and the Weizmann Institute, and at the Pasteur Institute in Paris.

Dr. David Nachmansohn was the Organizing Chairman of an international symposium on membrane proteins sponsored by the New York Heart Association. He was also Chairman and Organizing Chairman, together with Professor Severo Ochoa, of a symposium on molecular neurobiology at the annual meeting of the Federation of European Biochemical Societies in Madrid. He then gave lectures in Rome, Pavia, Israel, Berlin, Bern, Paris and spent some time in the Weizmann Institute with Dr. Israel Silman, and in the Institut Pasteur with Drs. J. P. Changeux and T. R. Podleski; in both Institutes the work on the electroplax initiated here is being continued.

Staff changes included the promotion of Drs. Roger C. Duvoisin, Donald H. Harter, Arthur Karlin and Robert E. Lovelace to Associate Professors;

Dr. Arnold P. Gold to Associate Professor of Clinical; Dr. Robert E. Barrett to Assistant Professor; Dr. Joseph L. O'Brien to Assistant Professor of Clinical; Dr. Ralph W. Richter to Assistant Clinical Professor (Harlem); Dr. L. William McLain, Jr. to Associate; Dr. John C. M. Brust to Instructor (Harlem).

New additions to the staff include: Drs. Stuart D. Cook and Peter C. Dowling, who have established a new laboratory for the study of cellular and circulating antibody responses in multiple sclerosis, peripheral neuropathy and related infections and inflammatory diseases of the nervous system. Dr. Richard F. Defendini has been appointed Associate in the Division of Neuropathology. The following have been appointed Research Associates: Drs. Hai Won Chang, Nobufumi Kawai, Luis A. Marco, Koho Miyoshi, William Poillon and Jiro Suzuki.

Drs. Philip B. Dunham (Syracuse), Wolf C. Forssmann (Geneva) and Alan R. Freeman (Rutgers) were guest investigators.

This year marked the retirement of Dr. Paul F. A. Hoefer who became Professor Emeritus. Dr. Rollo J. Masselink has retired as Assistant Clinical Professor.

The following members of the department recently resigned: Assistant Professors — Drs. Francis C. G. Hoskin and George M. Krauthamer; Instructors — Drs. Fidel Exconde, John H. Hardie and Gail E. Solomon; Research Associates — Drs. Dante J. Chiarandini, Hideo Hayashi, Walo Leuzinger, Gerald G. Lovinger, Jiri Machek, David Satchell and Shunichi Yamagishi; Assistants — William H. Gordon and Amal M. M. Mahfouz.

b. Major Changes in Curriculum

With the new curriculum, the clinical clerkship in neurology now includes also orientation in neurological surgery and physical medicine. In addition, one week is allocated to lectures in ophthalmology and otolaryngology. Two types of fourth year electives in neurology are being developed: — a clinical elective provides a senior clerkship (or junior internship); a neurobiology elective provides a review of fundamental knowledge of the nervous system, and an exposure to laboratory sciences in neurology. Teaching in the Division of Pediatric Neurology includes elective periods in pediatric neurology. The Harlem Hospital affiliation has enhanced this teaching program.

At the postdoctoral level the department now provides residency training for 18 in clinical neurology and 8 in pediatric neurology. Within the Parkinson Center, research orientation has been provided for 9 medical students, 5 predoctoral candi-

dates and 12 postdoctoral fellows. Weekly research seminars in neurobiology and especially basal ganglia disorders are provided. Within the Laboratory of Neurophysiology are 7 fellows in training.

The training program in neuropathology provided training for 5 fellows, 6 visitors from other institutions, one resident in neuropathology, and 15 residents assigned for training in neuropathology for two to six month periods from various services of the Neurological Institute and from the Neurological Service of the East Orange, New Jersey Veterans Administration Hospital. The introduction in 1967 of a perceptorship arrangement for strengthening the training of residents and other short-term people continues to work successfully, permitting them to receive more individual attention from staff members.

Patient Care

The department continues to carry a heavy load of clinical service for the local community as well as referrals from other areas. During the year, 3,048 patients were admitted to the Neurological Institute. There were, in addition, an average of 20 patients in pediatric neurology. There were 16,238 visits in the out-patient clinics, of whom 2,388 were new patients. The department is presently conducting a study of the composition of the clinic in an effort to determine the actual needs of this clinic population. Three quarters of the new patients seen in the adult neurology clinic were referred directly from the hospital's admitting emergency center; the remainder were largely referred from other special divisions of the Vanderbilt Clinic; few have a personal or community physician. The staffing of the clinic has been increased, to eliminate waiting, permit precise scheduling of appointments, and to provide for better patient care and supervised teaching.

A study is also being conducted of the problems of finding proper facilities for patients being discharged from the hospital. Lack of hospitals to provide nursing or long term care causes many patients to remain for unduly long periods at the Neurological Institute.

The Electroencephalographic Department is now under the direction of Dr. Eli S. Goldensohn. Active in the department, in addition to Dr. Goldensohn, are Drs. L. William McLain, Jr., Margaret Seiden, Robert E. Lovelace, Robert Esser, Maurice H. Charlton and Mr. Leonard Zablow.

The thirteenth floor of the Neurological Institute, housing electroencephalography, electromyography and brain scanning, was completely rebuilt with re-

sulting increased comfort to the patients and efficiency of the staff. 6,597 electroencephalographic examinations of the various types were performed during the year; an additional 906 examinations were performed in the clinic.

Dr. Lovelace has been responsible for the Clinic for Muscle Diseases and, since July 1, 1969, for the Myasthenia Gravis Clinic. He has been assisted in the investigation of patients with neuromuscular disorders by Dr. William R. Marksberry (Neuropathology); Dr. M. Gonzalez (Caracas, Venezuela); Dr. Oscar Encinosa (Merida, Venezuela); Dr. Judith Koehler (Anatomy). Drs. M. Richard Koenigsberger and Stanley J. Myers (Rehabilitation Medicine) have both acted as assistant electromyographers.

The clinical electromyography laboratory moved to its newly reconstructed quarters on the thirteenth floor in May 1969. It now consists of two fully screened modules, equipped with testing machinery. In addition, a third room has been loaned by Dr. Robert C. Darling (Rehabilitation Medicine). This room is situated on the eighth floor of the Neurological Institute. During the period November 1, 1968 to October 31, 1969, 772 electromyographic studies and 772 nerve conduction studies were performed — total of 1,544 tests. This represents a marked increase from the preceding year (1,308).

Neuropathological examinations included 77 autopsies from the Neurological Institute, 183 brains from other areas of the Presbyterian Hospital, 117 from Babies Hospital and 36 from Sloane Hospital. There were 97 fresh tissue examinations from the operating room, 567 surgical biopsies from the Neurological Institute and 66 spinal fluid millipore studies.

In 1969, a new 850 bed building was opened at the Harlem Hospital Center. The Neurology Service has been assigned 30 beds which are staffed by 3 interns, one medical resident and a supervising neurological resident. Attending rounds on the neurology unit are made daily and several staff members from the Neurological Institute are participating in these rounds. Residents from the Neurological Institute are continuing to rotate on the ward and consultation services at Harlem Hospital. Students from the Harlem Hospital School of Nursing and psychiatry residents from four New York State Hospitals also received special instruction on the neurology service. Approximately 1,300 in-patients were examined by the neurology consultation service.

In July 1969, Dr. John C. M. Brust joined the

neurology service at the Harlem Hospital. He has provided outstanding teaching and leadership and is also assisting in plans for development of a Harlem Community Stroke Program.

The Pediatric Neurology Service, under Dr. Koenigsberger, continues to serve many in-patients and out-patients with a variety of neurological conditions for whom these services were previously unavailable.

Dr. Leo Todman has continued to direct the Adult Neurology Clinic and has begun to organize an Adult Seizure Clinic.

Members of the Neurology Service continue to be involved in community programs for both prevention and treatment of heroin addiction and alcoholism.

Research

Parkinson's Disease. The Parkinson's Disease Research Center, under the direction of Dr. Melvin D. Yahr, completed six years of its operation. Clinical research is conducted by Drs. Yahr, Roger C. Duvoisin, Robert E. Barrett, Margaret Hoehn and Myrna Schear. L-DOPA studies began two years ago are now greatly expanded. At present, some 400 patients are under treatment and being evaluated for the efficacy and hazards of this drug. L-DOPA now appears to be the most effective agent yet uncovered for controlling the symptoms of parkinsonism. Its long term safety as well as its metabolism are now being studied. Of particular interest are the interactions of levodopa with other chemical agents and in this regard a striking incompatibility with pyridoxine (vitamin B⁶) was uncovered. An extensive review of our experience to date with levodopa was presented at the Ninth International Congress of Neurology.

Additional studies regarding the psychophysiological and biochemical aspects of L-DOPA in parkinsonism have been undertaken during the past year. Dr. Florry Proctor-Bowen has begun studies of perceptual alterations in patients with parkinsonism.

Drs. Yahr and Duvoisin, in association with Dr. Cote, are carrying out quantitative studies regarding levels of L-DOPA and its major metabolites in blood, urine and cerebrospinal fluid. These studies should provide better guidelines for administering L-DOPA.

Dr. Abner Wolf has continued to develop the Parkinson Brain Bank begun some eight years ago. There are now available for study 104 brains from many sources. Specimens will be studied by Dr.

Cote and used for viral studies by Drs. C. J. Gibbs and D. C. Gajdusek of the National Institutes of Health and Drs. Koho Miyoshi, Donald H. Harter and Wolf. Cases of progressive supranuclear palsy are being studied with Drs. Mendell and Booth and, here again, comparisons with the observations on our parkinson's disease cases are being made. Material from cases of kuru has been received from Dr. Klatzo and is being studied and added to the Bank.

The brains of three cases of parkinson's disease studied by Dr. Yahr and his associates and treated with L-DOPA have been obtained from New York Hospital, the Lenox Hill Hospital and the Greenwich Hospital and have been studied for any possible histopathological differences from those of untreated cases.

Drs. Wolf, Harter, Philip E. Duffy and Miyoshi are studying the characteristics of a neurotropic murine strain of influenza virus.

In the attempt to provide the tissue milieu in which the agent or factor causing parkinson's disease may best be reproduced and fostered in the brains of experimental animals, various techniques for producing such senile changes are being studied.

Dr. Herbert Barden received his Ph.D. degree during this year and has continued his investigations of neuromelanin and lipofuscins.

Drs. Sid Gilman and Harvey C. Ebel studied the unitary discharge of gamma motoneurons in control and decerebellate cats. Similar studies are being conducted by Drs. Gilman, Ebel and Luis A. Marco in monkeys with ablations of cerebral cortical areas 4 and 6 to determine the physiological basis of spasticity. Drs. Gilman, Ebel and Marco have initiated a study of the mechanism of the action tremor resulting from cerebellar lesions in the monkey. Drs. Gilman, Marco and Peter Carmel (Neurological Surgery) are investigating the neurological disorder which follows medullary pyramidal tract section in the monkey.

Drs. Gilman, Michael Potegal and Paula Copack are investigating physiologically the projections from the peripheral branches of the vestibular nerve to the basal ganglia. Drs. Gilman, Marco and Cote are determining the effects of injecting 6-hydroxy-dopamine into the substantia nigra of monkeys. They are studying the resulting neurological abnormalities and the alterations of basal ganglia catecholamine levels.

Dr. Ebel is also studying motor-learning tasks in monkeys, as a function of the complexity of visual cues.

Dr. Cote, in association with Dr. Sara Ginsburg, has been investigating the effects of various analogues of L-DOPA and Dopamine on brain catecholamines in experimental animals. Hopefully, this will lead not only to a better understanding of the manner in which these substances are metabolized, but also to the development of other effective yet less toxic substances in the treatment of parkinsonism. As an extension of this work, in association with Dr. Margaret R. Murray and Dr. H. Benitez (Surgery), Dr. Cote is studying the metabolism of catecholamines in tissue culture. To gain a better understanding of the etiology of parkinson's disease and the reasons underlying the depletion of brain Dopamine, studies relative to the structure and function of L-tyrosine, the rate-limiting enzyme, in catecholamine metabolism have been undertaken by Dr. William N. Poillon.

Dr. Leon T. Kremzner is continuing studies of the occurrence, metabolism and function of the polyamines (spermidine and spermine) and the diamine putrescine in the nervous system of animals and man. The relationship of the polyamines to nucleic acid metabolism during development, growth and aging is also being determined. In collaboration with Dr. Ginsburg, specific enzyme inhibitors are being designed and synthesized so as to inhibit the formation of the polyamines. In conjunction with Drs. Duffy and Richard F. Defendini (Neuropathology), metabolism of polyamines in nervous system tumors is being correlated with tumor histology and pathology. In conjunction with Dr. Harter, an *in vitro* study of the anti-viral activity of oxidized polyamines and aldehydes has been completed; *in vivo* studies have begun.

Drs. Kremzner and Barrett are continuing studies of the biochemistry and histology of nerve degeneration and regeneration following physical nerve sectioning. Dr. Kremzner is continuing his studies of the molecular properties of the enzyme, acetylcholinesterase. In collaboration with Dr. Philip Rosenberg (University of Connecticut), biochemical and physiological studies were conducted (Wood's Hole Marine Biological Laboratories) on the metabolism of acetylcholine.

Dr. Ginsburg, in collaboration with Dr. Richard Kitz (Harvard University), is studying the structural requirements for neuromuscular blocking agents. A large number of compounds related to acetylcholine are being synthesized and evaluated *in vitro* and *in vivo*. In addition, Dr. Ginsburg's classical studies of the structure-activity relationships of compounds which inhibit acetylcholinesterase are continuing.

In experiments with rats intoxicated with methanol, Drs. Gerald Cohen and Barrett were able to demonstrate the presence of similar alkaloids produced by condensation of catecholamines with formaldehyde. Experiments support the viewpoint that isoquinoline alkaloid synthesis in nerves and other tissues may play a prominent role in mediating behavioral changes, including withdrawal signs, in alcoholism.

Drs. Soll Berl and Saul Puszkin have continued their studies on the actomyosin-like protein which they have isolated from mammalian brain. Dr. Berl, in collaboration with Dr. Tamas Frigyesi (New Jersey College of Medicine), is continuing his studies on the effect of chronic lesions placed on the area of the substantia nigra on the metabolic compartmentation of glutamate and its associated metabolite in the caudate nucleus, thalamus and cortex. The metabolic effect of these lesions are being compared with the effects obtained from lesions placed on other brain areas. Dr. Berl has also started a study of the levels of glutamate, glutamine, aspartate and asparagine in the spinal fluid of patients with parkinson's disease and the effect of drug therapy on the levels of these amino acids.

Dr. Frederick A. Mettler has concluded a study of the retrograde changes seen in the substantia nigra following removal of those portions of the brain to which that structure is believed to project.

Dr. Mettler's researches on dyskinesias have been pursued along the lines of azide toxicity previously reported and, with Dr. Sarah Luse (Anatomy), these studies are being extended into the field of electron microscopy.

With Dr. Daniel Sax, (Montefiore Hospital), Dr. Mettler has pursued studies upon the production of cerebellar atrophy by acute azide poisoning.

Data on the origin of the climbing fibers of the cerebellum is being compiled. Thus far it would appear that Professor Eccles' assumption that the inferior olive is the sole source of these fibers requires revision.

Dr. Mettler is further engaged in a cooperative venture with Dr. Charles R. Noback (Anatomy) on the study of the fiber components of the optic chiasm and juxtachiasmatic commissural systems.

Cerebral Vascular Disease. Dr. Barrett is working in conjunction with Drs. Robert Fraser, Bennett Stein and J. Lawrence Pool (Neurological Surgery), on cerebral vasospasm and the effects of adrenergic blockade and catecholamine morphology.

A controlled study of the role of steroids in the treatment of stroke is in progress.

Multiple Sclerosis and Encephalitis. Drs. Stuart D. Cook and Peter C. Dowling have established a new laboratory for the study of immune responses in inflammations of the nervous system. Cellular and antibody responses in Guillain-Barre syndrome, encephalitis and multiple sclerosis are under investigation. Cellular responses in Guillain-Barre syndrome have proven to be accurate predictors of the severity and duration of the disease.

Drs. Hoehn and Yahr have completed purification and preliminary testing in preparation for a clinical trial of antihuman thymocyte globulin in multiple sclerosis.

Within the Neurovirology Laboratory, under the direction of Dr. Harter, the principal agent under study is visna virus, the cause of a slowly-evolving encephalitis of sheep characterized by subacute inflammation and demyelination of brain and spinal cord.

In collaboration with Dr. Kremzner, the antiviral activity of the oxidation products of the naturally occurring polyamines, spermine and spermidine has been investigated. These agents can exert a potent antiviral effect in vitro and may be of therapeutic use.

Epilepsy. Drs. Goldensohn and McLain have been studying the mechanisms involved in the production of seizure discharges. These studies involve the intracellular recording of paroxysmal depolarization shifts seen in penicillin foci in experimental preparations. Studies on low amplitude fluctuations in neural membranes are continuing. In a related study with Dr. Murray, the response of single neurons in tissue culture to epileptic and anti-epileptic drugs and to changing ion concentrations is being investigated. Mr. Zablow is continuing his collaboration with Drs. Goldensohn and McLain in computer analysis of single cell activity in experimental preparations. Using computer analysis and photographic display, Drs. Goldensohn, McLain and Mr. Zablow are engaged in a study of the temporal and spatial distribution of EEG spikes recorded directly from the cortex of man and from the scalp. Mr. Zablow has continued his work on a model for cortical localization of EEG foci as well as computation of scalp potential distributions due to cortical dipoles of specific locations. Drs. Goldensohn, Gail E. Solomon and Mr. Zablow are continuing the study of the relationship of slow potentials and alpha rhythm recorded from the scalp. Drs. Goldensohn, Stein and Mr. Zablow are studying the interrelationship of the forms and latencies of spike

discharges recorded from small areas of the cortex of man.

As an outgrowth of studies previously begun as to the pathophysiology of experimental epilepsy, Dr. Bowen has been studying the uptake of serum proteins using the direct fluorescent antibody technique. Cryogenic lesions have been produced in the rabbit motor cortex and the ability of such sites as well as secondary epileptogenic foci to bind these proteins are being studied. In addition, in association with Dr. Maurice M. Rapport (Biochemistry), an investigation of the effects of intraventricular antisera to brain fractions are underway. In a further extension of this work, penicillin epileptogenic foci have also been made and studies as to the uptake of serum proteins in mirror foci are being carried out.

Dr. Charlton, with Dr. James Mellinger, finished an analysis of 195 cases of infantile spasms seen at the Medical Center in the years 1961-1969. This analysis will form the basis for drug testing of this form of epilepsy.

The Division of Neuropathology is conducting a series of studies of the effect of the antimetabolite, 6-aminonicotinamide (6-AN), on sound-induced seizures in highly seizure-susceptible mice, by Drs. Lester M. Geller, and Wolf, joined in a later phase by Dr. Mario Kornfeld (former trainee in Neuropathology).

Headache. Dr. Arnold P. Friedman continued his studies on certain phases of the biochemical and pharmacological responses of patients with vascular headaches of the migraine type; and, special studies on nocturnal headaches and biogenic amines: also, investigations on chemical agents in the symptomatic and prophylactic treatment of headache.

Neuromuscular Diseases. Dr. Lovelace and Mr. Zablow have continued their microelectrode studies of human muscle *in situ*.

Dr. Lovelace, working with Dr. Gonzalez and Miss Karen Kartlie (technician), has completed a series of experiments on animals treated with diphenylhydantoin on an acute and chronic basis.

Drs. Lovelace, Myers and Mr. Zablow have completed their studies for the measurement of peroneal and posterior tibial sensory nerve action potentials. Their technique should prove valuable in investigation of peripheral neuropathy as reported at the VIIth International Congress of Electroencephalography and Clinical Neurophysiology.

Drs. Lovelace and Matthew Menken completed their investigations of three patients with the scapulo-peroneal type of late onset myopathy. This material was presented at the Ninth International

Congress of Neurology. Dr. Lovelace and Mr. Zablow, working with two students, Richard Stone (P&S) and George Toufexis (McGill), studied end-plate potentials in normal and myasthenic patients, using standard electromyographic macro-electrodes.

Drs. Encinoza and Lovelace have investigated a number of patients with hypothyroid disorders who have manifested both myopathic and peripheral neuropathic changes. The electrophysiological data on these patients has been correlated with clinical states and this material is being prepared for publication.

Drs. Koehler and Lovelace are attempting to produce an auto-immune myositis in guinea pigs, using cultures of muscle. The normal electromyographic parameters of muscles from several locations in these animals have been determined and will be compared with treated animals, and correlations with histological and immunochemical studies will be made.

Dr. Lovelace is developing a central organization for the collection and distribution of muscle biopsy material for the chemical analysis, electromicroscopic, and routine histological examination.

Neurological Disorders of Children. Within the Division of Pediatric Neurology, under Dr. Sidney Carter, studies of the neurological disorders of children included a number of clinical investigations.

The syndrome of inappropriate antidiuretic hormone (SIADH) secretion, which had not been previously reported in children with brain tumors was studied by Drs. Abe Chutorian and Ronald Brisman (Neurological Surgery) in a six year old boy with a third ventricular glioma in whom SIADH antedated the surgery.

Drs. Stein, Brisman, Carter and Sanford Schneider have initiated an investigation utilizing the intrathecal injection of Ringer's solution to test shunt function in hydrocephalic children.

Drs. John F. Nicholson (Pediatrics), Chutorian and Schneider are studying an infant with an inborn error of metabolism manifested by lethargy, impaired motor function and hyperammonemia after protein feedings. They are attempting to define the enzymatic defect and are investigating an experimental treatment program. Drs. Chutorian and Edward Hart are studying an infant with an unusual form of mucopolysaccharidosis.

Drs. Solomon, Arnold P. Gold, Carter and Sadek Hilal (Radiology) completed their reevaluation of children with acute acquired hemiplegia who had been studied at the Columbia-Presbyterian Medical Center since 1940.

Disorders of language and perception in children and adults are being investigated by Dr. Martha B. Denckla. Dr. Defendini, together with Dr. Denckla, has also carried out a clinicopathologic correlation of two autopsied cases of "conduction" aphasia.

Drs. Geller, Cowen and Wolf are continuing their investigation of the etiology and consequences of perinatal damage to the central nervous system, emphasizing study of the possibility of overcoming or ameliorating the retarding effects of prenatally-induced brain damage, in rats, upon learning and memory abilities, by treatment of the injured animal during its early development.

Drs. Geller, Cowen and Wolf have also described a simple technique, utilizing multiple electroconvulsive shocks, for the rapid and consistent production of closed-head, bilaterally symmetrical, focal lesions in the infant rat's cerebral cortex, without the incidental damage that accompanies other experimental injuries to the central nervous system. Comparable lesions have been produced by others in adult animals with a beam of heavy ionizing particles but this requires the use of a cyclotron or linear accelerator. The lesions can be profitably employed for the study of several fundamental topics in the injured immature central nervous system such as differentiation of glial and nerve cell precursors and of glial cells *per se*, development of axons and of myelin sheaths, formation of abnormal glia, cell migration, and the regenerative capacity of nerve cells. Dr. Cowen, together with Drs. Geller and Wolf, has studied the histopathologic events taking place in the brain of the immature rat after induction of the electroshock lesions.

Neurobiology. The Laboratory of Neurophysiology, under the direction of Dr. Harry Grundfest, continues its studies on contractile activation of muscle, neuromuscular and neuronal transmission, membrane properties of axons, electroplaques, muscle fibers and neurons, as well as on the analysis of ionic mechanisms of the electogenesis in lipid bilayer artificial membranes.

Investigations in the Laboratory of Neurochemistry, under Dr. David Nachmansohn, are devoted primarily to the analysis of the properties and function of the two proteins directly associated with the

permability changes in excitable membranes during electrical activity: acetylcholine (AcCh)-receptor and esterase. Related to studies of these enzymes, the mode of action of organophosphates has been for a long time an important area of interest. Such compounds are widely used as insecticides; their fatal action is due primarily to the inhibition of AcCh-esterase.

Among various other results may be mentioned the work with photochromic substances carried out by Dr. Walter Deal in collaboration with Dr. Bernard F. Erlanger (Microbiology) and his group. The photochemical event in vision is the isomerization of the 11-cis to the all-trans configuration of the retina of rhodopsin that takes place when the light is absorbed. Applying to the intact electroplax membrane specifically designed inhibitors of the Ac-Ch-receptor, which exist in two geometric isomers, *cis* and *trans*, interconvertible by means of light, the potential difference across the excitable membrane has been shown to be photoregulated.

An account of the work of the Immunochemical Laboratories which is carried out jointly in the Departments of Microbiology and Neurology under Dr. Elvin A. Kabat will be found in the report of the former department.

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Nursing

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Much of the efforts of members of the Nursing Department have been directed toward meeting the challenges presented by the social and economic changes taking place in the United States and in the Columbia-Presbyterian Medical Center this year. These changes present problems to which answers must be found if we are to achieve our two major goals: providing the highest quality of nursing care to patients in the Columbia-Presbyterian Medical Center and the Washington Heights community, and preparing nurses capable of providing the highest quality of comprehensive health care to all people in any community in which they decide to work. Nursing faculty and nursing service personnel have been exploring with the medical staff and with hospital administration the role of the nurse in the many different clinical areas, the most efficient use of personnel in providing nursing care to patients, and how different kinds of nursing personnel can best be prepared to provide nursing care to patients.

The Nursing Department was saddened by the death of two of its members during the past year. Mr. William DeWald, Supervisor of the Attendant Department died in August, 1969. Mr. DeWald has been with the Columbia-Presbyterian Medical Center for 19 years, and in charge of the Attendant Department since 1950. Miss Marjorie Peto retired as Assistant Director and Assistant Professor of Pediatric Nursing in May 1969. She died on September 30, 1969. Miss Peto was a graduate of the Presbyterian Hospital School of Nursing, Class of 1926. Many will remember her as chief nurse of

the Second General Hospital Unit during World War II. Her contributions to nursing, to the care of children, and to the Columbia-Presbyterian Medical Center will be remembered for many years. Another very highly respected member of the Nursing Department retired in 1969. Miss Marion Cleveland had been Director of Nursing Service and Assistant Professor of Nursing since 1955. She had been a member of the Columbia-Presbyterian Medical Center for 45 years. All who worked with her remember her for her willingness to listen, her astute ability to see all sides of an issue, and her superior sense in the decorative arts. Miss Mary Windrow has been appointed as Director of Nursing Service and Assistant Professor of Nursing. New appointments in the masters programs include Miss Patricia Lind and Miss Linda Hamlin in maternity nursing and nurse-midwifery. In the undergraduate program, new appointments include: Ursula Brady, behavioral sciences; Doris Barker, maternity nursing, Jayne Jackson and Elizabeth Mahoney, medical-surgical nursing; Mary Knipe and Jane Rosamilia, psychiatric nursing; Gay Gilbert, long term nursing and Roberta Spagnola, Director of Residence. Miss Sara Sheets has returned from an educational leave and has been appointed as Assistant Professor in pediatric nursing. Two additional instructors have been appointed in the practical nurse program: Miss Jane Jewell and Miss Annie L. Bryant, and one new instructor has been appointed in the operating room technician program, Miss Betty Sanford. Miss Marilyn Stein has been appointed as Educa-

tional Coordinator in neonatal intensive care nursing.

The following degrees were earned by members of the faculty during 1969: Ed.D., New York University, Ann Earle; M.Ed., Teachers College, Columbia University, Sara Sheets; and M.S., Department of Nursing, Faculty of Medicine, Columbia University, Doris Barker and Mary Kripe. Edith Benoit, Assistant Professor of Nursing; Columbia University and Director of Nursing, Harlem Hospital received the Nursing Education Award from Omicron Chapter of Chi Eta Phi.

Four students completed the requirements for the M.S. degree in psychiatric-community mental health nursing and six students completed the requirements for the same degree in maternity nursing and for the certificate of nurse-midwifery. A joint curriculum committee has been formed for these two programs and for the first time joint courses are being offered with shared clinical experience.

Of the 112 students completing the requirements for the B.S. degree, 96 had been enrolled in the program for students transferring to the Department of Nursing having completed two years of liberal arts courses and 16 were enrolled in the program for college graduates.

Recruitment efforts have been expanded in two dimensions in the undergraduate program. Faculty and students, as well as the recruitment staff, worked with groups in local secondary schools promoting nursing through college preparation and interpreting opportunities for college preparation in nursing for minority groups. Regional alumnae groups have been organized to assist with these efforts throughout the country.

The construction grant which had been awarded by the United States Public Health Service and matched by the generous gifts of Mr. and Mrs. W. Van Alan Clark, was funded in the spring of 1969. Excavation for the new unit is very nearly completed.

The Student Scholarship Fund Benefit Bridge Committee surpassed their efforts of last year and raised \$15,000 for scholarship assistance. Other sources of scholarship assistance include the Hartford Foundation, the Edna McConnell Clark Foundation, the Quaker Hill Foundation, the Columbia University-Presbyterian Hospital School of Nursing Alumnae Association, and the Presbyterian Hospital Women's Auxiliary and the United States Public Health Service.

The first class accepted into the Columbia-Presbyterian School of Practical Nursing graduated in September of this year. Fourteen of the fifteen graduating students joined the nursing staff of the Presbyterian Hospital. The School has now received full

accreditation from the New York State Education Department. Two more classes have been admitted, one in May and another in September. Sources of scholarship assistance for this program include The John A. Hartford Foundation and the Alfred Harcourt Foundation.

An eight months program for operating room technicians was initiated in May of 1969 and a second group of students was admitted in September. This program is offered to qualified high school graduates and includes instruction in anatomy and physiology, fundamentals of operating nursing, and supervised practice.

Over 200 registered nurses and 50 licensed practical nurses have completed the twenty-one hour orientation program offered by the members of the staff development department this year. Sixty employees have completed the six weeks program for nurses aides. In-service programs have been attended by over 600 members of the nursing staff. Special programs have been set up for college aides employed for the summer and for medical students who wish to work as attendants. Thirty-five of the 157 supervisory personnel completing the American management course on developing supervisory leadership skills were from the Nursing Department. These courses were offered to supervisory personnel of all departments of the Hospital by Miss Lillian Oring from personnel and Miss Cynthia White from nursing.

Several European nurses associations are now directing their members to the Exchange Visitors Program. The increasingly international representation now includes Australia, Austria, Denmark, England, India, Israel, Japan, Korea, Liberia, Netherlands, Norway, the Phillipines, Spain, Sweden, Switzerland and Taiwan. These nurses have access to the resources of the University and the Hospital while they are here at the Columbia-Presbyterian Medical Center and in turn bring with them a breadth of experience and a diversity of background which offers opportunities for all to develop increased cultural insights and a broader perspective concerning health services around the world.

The position of Coordinator of Nursing Care and Associate Professor has been created this year in medical surgical nursing to study the effectiveness of nursing care, to develop continuing education programs, to coordinate service and education, and, where needed, to develop plans for more effective use of personnel. Miss Constance Cleary has been released from her faculty position for a period of two years to fill this position. Her first project has been to mobilize faculty and staff in the develop-

ment of a program to prepare nurses to work in the new cardiac intensive care unit.

Under the leadership of Miss Marilyn Stein, a neonatal intensive care conference was held on October 29-30, 1969. Representatives from universities and medical centers in fourteen states and all regions of the United States participated in this conference aimed at developing educational objectives in neonatal intensive care nursing.

In October 1968, Maternity Center Association provided scholarship funds for internships for two nurse-midwives who had completed the requirements for their Master of Science degree in maternity nursing and the certificate of nurse-midwifery in August of that year. Under the guidance of Miss Ruth Helmich, Miss Lee Brundage and Miss Patricia Lind explored the potentialities in Sloane Hospital for developing a nurse-midwifery service. At the end of this period, plans were worked out for the creation of a position of Director of Nurse-Midwifery Service to be supported in part by Maternal and Infant Care Projects #507, New York City Department of Health and in part by the Presbyterian Hospital. Miss Ruth Helmich transferred from the faculty to this position in May. As a result of reorganization of nursing staff, two additional positions have been created in the nurse-midwifery service.

Faculty, students and staff have been active in studying methods for improving nursing care. Four undergraduate students received student fellowships for four months from the Health Research Training Program of the New York City Department of Health to study patient needs and attitudes in the Vanderbilt Clinic. This study was carried out under the guidance of Miss Lucy Kennedy and Dr. Joseph Snyder. Miss Susan Maines, chairman of the subcommittee on audiovisual facilities of the Faculty of Medicine Curriculum Committee has conducted a survey of audiovisual materials and equipment at the Columbia-Presbyterian Medical Center. Miss Robbin Clark was elected student representative from the student body of the Faculty of Medicine to the Columbia University Senate.

Faculty and staff have contributed as speakers and consultants in many areas related to nursing and health care. Dr. Mary Crawford served as accreditation visitor for the National League for Nursing and for the American College of Nurse-Midwifery, as chairman of the Committee on Standards, Division of Maternal and Child Health Nursing Practice of the American Nurses Association, and as a member of the ad hoc committee on costs of schools of nursing for the Conference of Deans and

Directors of Educational Units in Nursing in Senior Colleges and Universities in New York State. She also acted as moderator for a panel on In-Service Education at the New York State Nurses Convention in New York City and presented a paper on the utilization of the baccalaureate degree graduate in the clinical setting at the New Jersey State Nurses Association in Atlantic City, New Jersey and also spoke on the role of the clinical specialist in nursing at the annual meeting of the Michigan Association of Industrial Nurses in Detroit, Michigan. Miss Ursula Brady is serving as consultant to the Long Island School of Nursing.

Mrs. Edith Benoit is chairman of the Human Relations Committee of the New York State Nurses Association and a member of the committee to study the Nurse Practice Act of New York State. Miss Lucy Kennedy is serving as program chairman for the New York State League for Nursing and is also serving on the Manhattanville Community Comprehensive Health Service Center Advisory Council, the Washington Heights West Harlem-Inwood Community Mental Health Council, and the Washington Heights Health Council. Miss Kennedy presented a paper to the Westchester County Industrial Nurses Association on the trends in nursing education. Miss Ruth Helmich participated in three workshops at West Virginia University presenting several papers on family planning. Miss Marilyn Staats participated in a panel discussion on baccalaureate education after diploma and associate degree programs presented by the Student Nurses Association of New York State, and Miss Mary Henderson presented a paper at Fordham University on careers for the science major.

Other faculty and staff are actively participating in the work of many different professional organizations. Miss Martha Haber has been appointed by the American Neurological Association to the Joint Committee on Stroke Facilities. Miss Edith Ankers was a member of the committee which developed plans for the Regional Council of Practical Nurse Education. She is also a member of the Revision Committee of the Council of Practical Nurse Programs of New York State, the Scholarship Awards Committee of the National Federation of Licensed Practical Nurses, and the Planning Committee for the National Convention of the National Association of Practical Nurse Education Service. Miss Elizabeth Mahoney is President of the Westchester Chapter of the National Council of Catholic Nurses. Miss Susan Greenberg is president of the Alpha Zeta Chapter of Sigma Theta Tau and Miss Shirlee Stokes is vice-president. Miss Mary Windrow is

treasurer of Nurses House. Miss Susan Maines is a member of the Review Committee for the National Study of Audio-Visual material available for nursing education and service of the American Nurses Association, National League for Nursing Film Service. Miss Mary Henderson is participating

in the Hunts Point Multi-Service Projects organized for the purpose of planning health care for the South Bronx and also the community health projects in Mott Haven community and Washington Heights community.

1969 Publications

Nursing

Crawford, M.

Physiological and behavioral cues to disturbances in childbirth. *Bull. of Amer. College of Nurse-Midwifery*. **14**:13-24, February, 1969.

Physiological and behavioral cues to disturbances in childbirth. *Bull. of the Sloane Hospital for Women*. **14**:132-142, Winter, 1968.

Gilbert, G.

Basic concepts of patient monitoring and defibrillation. *Nursing Clinics of North America*. **4**:615-619, December, 1969.

Haber, M.

Parkinson's disease, challenge to the health professions. *Nursing Clinics of North America*. **4**:263-273, June, 1969.

Sheets, S., et al

Study guide for film: Robin, Peter and Darryl, Three to the Hospital. *Columbia Center for Mass Communication*, New York, 1968.

Stokes, S.

Fasting in obesity. *Amer. J. of Nursing*. **69**:796-799, April, 1969.

Obstetrics and Gynecology

CHARLES M. STEER

*Professor of Clinical Obstetrics and Gynecology and Acting Chairman of the Department
Acting Director of the Service*

Teaching

There was a considerable change in the teaching activities of the department due to the reorganization of the Medical School curriculum. The clinical activities and research programs continued in a very productive way.

Staff Changes

Dr. Karlis Adamsons was promoted to Professor of Obstetrics and Gynecology. Dr. Charles M. Steer was promoted to Professor of Clinical Obstetrics and Gynecology. Dr. Equinn W. Munnell was promoted to Clinical Professor of Obstetrics and Gynecology. Dr. Kotaro Suzuki was promoted to Assistant Professor of Obstetrics and Gynecology. Dr. Erlio Gurpide left the department to become Professor of Biochemistry and of Obstetrics and Gynecology at the University of Minnesota. Dr. Kenneth Roberts left the department to become Assistant Professor of Biochemistry at the University of Montreal. Dr. Harald Mickan left the department to join the department at the Universitats Frauenklinik at Heidelberg. Dr. Alvin Tillman and Dr. Thomas J. Parks retired.

Postdoctoral Fellowship Program

The two United States Public Training Fellowship Programs continue to be highly successful. At present there are five members in the reproductive biology program and three members in the biochemistry and endocrinology program.

Major Changes in Curriculum

During this year major changes in the curriculum of the Medical School have led to a reorganization of the teaching activities of the Department of Obstetrics and Gynecology. The Teaching Committee, under the direction of Dr. Equinn W. Munnell, has continued to carry out the necessary work of changing the entire teaching schedule. Teaching programs in the affiliated hospital service at Harlem Hospital, Woman's Division of St. Luke's Hospital, the Francis Delafield Hospital and the Roosevelt Hospital continue to be of great value. The department held its ninth postgraduate course, which was attended by over two hundred doctors.

Patient Care

This year was marked by a steady increase in the amount of monitoring which can be carried out on patients in labor so that the condition of the fetus during labor can be determined. This program, under the direction of Dr. Harry Cohen, has been of great value in promoting the well-being of mothers and their babies during labor and in adding to an understanding of the physiology of the fetus during labor. The statistics will follow at the end of this report.

Research

Reproductive Biochemistry

The laboratory, under the direction of Dr. Seymour Lieberman, continues its studies of the bio-

chemistry and metabolism of the steroid hormones.

Dr. Kenneth Roberts, has been continuing his investigation into the nature of the conversion of cholesterol into pregnenolone. He has been attempting to demonstrate that the side-chain cleavage of cholesterol is mediated through mechanisms analogous to those characteristic of free radicals.

Dr. Erlio Gurpide, Dr. Linda Tseng and Miss Margaret Welch continued their studies on the dynamics and uptake of estrogens and androgens by target tissues. These *in vitro* experiments involve the constant flow perfusion of slices of human endometrium, placenta, prostate and other tissues with media containing a mixture of tracers of estrogens and androgens. Using this design, experiments were performed on rabbit liver slices to study the uptake and conversion of both cortisone and cortisol.

In vivo and *in vitro* studies of the rates of production and metabolism of circulating uridine and cytidine in dogs were made by Dr. Gurpide and Miss Jaffa Barelkovski. The purpose of these studies was to estimate the rates at which uridine and cytidine are released *de novo* into the circulation and, therefore, made available to tissue.

Dr. Paula Zimmering is continuing her studies on the purification and properties of the uterine receptor macromolecules with particular emphasis on their binding characteristics to 17β -estradiol and progesterone.

Dr. Wylie Hembree is working in collaboration with Dr. Alfred P. Wolf of the Department of Chemistry at the Brookhaven National Laboratories, and with Dr. Paula Zimmering, on a program designed to find a technique for tritium-labeling of polypeptide hormones. Their objective is to prepare labeled hormones of sufficiently high specific activity so that the products may be employed to study the mode of action of these hormones. The techniques have proved successful in obtaining a wide variety of tritiated, high specific activity organic compounds, including cyclic hydrocarbons, steroids, amino acids and polypeptides. ACTH has been chosen as the model polypeptide hormone for studying the tritiation method and the consequences of the technique for the biological and immunological characteristics of the labeled hormone. In this connection, antibodies to ACTH have been obtained from rabbits. A sensitive radio-ligand assay for plasma corticosterone in rats has also been developed for testing the biological integrity of the purified, tritiated ACTH.

Dr. Ross Dixon, ha been engaged in the study of the feto-maternal transfer of cortisol in the pregnant sheep. In collaboration with Dr. Erlio

Gurpide and Dr. Alan Hyman (Anesthesiology), he has determined the rates of transfer of cortisol between the maternal and fetal circulation.

Dr. Jef Raus (from Belgium), graduate student in Biochemistry, is attempting to obtain evidence that the complex formed between estradiol and a receptor macromolecule found in uterine tissue plays a role in the mediation of the biological effects of the hormone.

Dr. Richard Hochberg has been studying the conversions of cholesterol and cholesterol sulfate into free and sulfated steroids by adrenal mitochondria in an attempt to determine the factors which control these transformations.

Drs. Hochberg and Harald Mickan, have attempted to confirm the existence of a pathway of steroid biosynthesis that involves the "direct" conversion of cholesterol into dehydroisoandrosterone by cleavage of an 8 carbon fragment.

Dr. Hochberg and Mr. Theodore vande Hoeven (graduate student), are investigating the heterogeneity of adrenal mitochondria. They are attempting to partition adrenal mitochondria into various classes and to analyze each class for its capacity to use cholesterol or its sulfate as precursors for the steroid hormones. These studies are being carried out with the collaboration of Dr. Sarah A. Luse (Anatomy) who is examining the sub-cellular particles by electron microscopy.

Cytogenetics

The laboratory was under the direction of Dr. Dorothy Warburton throughout most of the year, during Dr. Orlando J. Miller's absence on sabbatical leave. The laboratory has continued its studies of human chromosomal abnormalities and their causes. Drs. Adriana de Capoa, Penelope Allderdice, D. Warburton and Orlando J. Miller worked out a more accurate method for identifying the D-group chromosomes (13, 14 and 15) using quantitative autoradiographic analysis of terminal DNA replication sequences and have applied it to the study of structural abnormalities of the D-group.

Dr. Warburton, in collaboration with Dr. A. F. Naylor, Perinatal Research Branch, National Institute of Neurological Diseases and Stroke, has completed a study of placental weight and birthweight which suggests that the usual increase in these factors with parity may be the result of maternal immunization to paternally derived antigens in the fetus.

Several studies on chromosome breakage have been carried out. Dr. Syed Abdullah (Psychiatry) continued his analysis of the effect of drugs on

nucleic acid synthesis and chromosome breakage. Drs. de Capoa and Miller, in collaboration with Drs. Jerry Jacobs (Pediatrics), William A. Blanc (Pediatric Pathology), W. C. Heird (Pediatrics), Eva McGilvray (Pediatric Pathology), Jane Morse (Medicine), R. D. Rossen (Microbiology), J. Schullinger (Pediatrics) and Stanley Walzer (Dermatology) have completed a study of chromosomal breaks and complement deficiency in a case of Swiss-type agammaglobulinemia. Drs. de Capoa, Miller, Lionel Grossbard (Medicine), D. Rosen (Medicine) and Arthur Bank (Medicine) have completed studies in a drug (including LSD) used with acute leukemia.

Dr. Allderdice has collaborated with Drs. Irene Weitzman (Dermatology) and Margarite Silva-Hutner (Dermatology) in the cytogenetic analysis of meiosis in the medically important fungus *Arthroderma benhami*.

Drs. Allderdice, Miller and Warburton have continued their analysis of terminal DNA synthesis in homologous autosomes, one of which has a deletion.

Dr. Miller, in collaboration with Professor Henry Harris, Sir William Dunn School of Pathology, University of Oxford, England and Professor George Klein, Dr. Peter Worst and Dr. T. Tachibana, all of the Department of Tumor Biology, Karolinska Institutet, Stockholm, has studied the malignancy of three types of mouse ascites tumor cells, i.e., their ability to grow progressively after inoculation and kill the host.

Endocrinology and Fertility

Dr. Raymond Vande Wiele and members of the Division of Clinical Endocrinology have continued their studies of the human menstrual cycle. A mathematical model of the human menstrual cycle has been constructed and computer simulation studies based upon this model have been performed. These studies are carried out in collaboration with Dr. Jacob Rootenberg (Electrical Engineering) and Mr. Robert J. Bogumil, a graduate student at the School of Engineering and Applied Sciences.

Dr. Michel Ferin has developed a radioimmunoassay for plasma estradiol and estrone. This method, which employs antibodies to estradiol produced by the hapten principle, is remarkably specific and sensitive. Dr. Ferin, together with Drs. Antonio Tempone and Joseph Raziano, has continued his physiologic studies with antibodies to estradiol and progesterone.

Drs. Inge Dyrenfurth, Tawfik Rizkallah, and Michelle Warren have determined the blood levels of estradiol, estrone, progesterone, FSH, and LH

throughout 18 cycles in women with normal ovulatory cycles. In addition, urinary estradiol and pregnanediol have been measured, permitting a comparison between the changes in blood and urinary steroids.

Dr. Rizkallah has measured the metabolic clearance rate and half-life of human chorionic gonadotropin in both males and females.

Dr. Dyrenfurth has studied the function of the corpus luteum in amenorrheic women following induction of ovulation by sequential therapy with human menopausal and human chorionic gonadotropins.

Dr. Raphael Jewelewicz has studied the corpus luteum function in amenorrheic women following induction of ovulation by sequential therapy with human menopausal gonadotropins and human pituitary luteinizing hormones.

Dr. Ross Dixon, in collaboration with members of the Department of Anesthesiology, has completed a study of the rates of production of cortisol by fetus and mother, and a fetal-maternal transfer of cortisol in sheep near term.

Dr. Tibor Engel, with Dr. Andrew Frantz (Medicine) has completed a study of growth hormone secretion in patients with amenorrhea.

Drs. Robert Neuwirth, Ralph Richart and Raymond Vande Wiele have begun a project for the development and refinement of techniques for study of the internal reproductive tract of primates such as the Rhesus monkey. Drs. Richart and Neuwirth, using rabbits and monkeys, are seeking to develop a simple technique for sterilization of women which can be carried out as an outpatient procedure.

Reproductive Biochemistry and Physiology

Drs. Edward Bowe, Ross Dixon, Erlio Gorpide, Raymond Vande Wiele and Allen Hyman (Anesthesiology) studied the transfer of various hormones from the maternal to the fetal compartment *in vivo* in the pregnant ewe and fetal lamb, using the chronic catheter technique.

A study of maternal urinary estriol levels in high risk pregnancy was begun by Dr. Dyrenfurth.

In the Delafield Research Laboratories under the direction of Dr. Ines Mandl the study of the effects of actinomycin D and puromycin injected into rats on different days of the gestational cycle has been continued by Dr. Carlton Blackwood, Mrs. Yvonne Hosannah and Dr. Mandl.

Physiology and Abnormalities of Pregnancy

Dr. Solan Chao and Dr. Raphael Boulanger (Medicine) are continuing their study of thyroid

disease in pregnancy, particularly with the use of the tyrosine tolerance test as a thyroid function test in pregnancy.

Dr. Chao and Dr. Philip Johnson (Radiology) are continuing their investigation of Indium^{113M} as a radioisotope for placental scanning.

Dr. Thomas Murray and Dr. Edward Bowe are using fetal scalp sampling techniques to study the transmission of magnesium sulfate from mother to fetus.

Dr. Kotaro Suzuki, in collaboration first with the late Dr. Albert Plentl, then with Dr. Karlis Adamsons, has completed a study of the exchange of carbon dioxide between mother and fetus in the Rhesus monkey. In this study the carbon dioxide kinetics were analyzed by means of a computer program (SAAM-22) utilizing a seven compartment model. Study of water exchange in pregnant Rhesus monkeys has been continued.

Dr. Freda has begun studies to establish the feasibility of suppressing the already established Rh immune response. One phase of this study is concerned with inactivating the Rh antibody clones already actively producing antibody by deliberate specific Rh antigenic challenge followed by immunosuppressive (cytotoxic) agents. The cytotoxic agent is made to be specific in action by providing the corresponding specific antigenic agent.

Dr. Richard Perkins completed a monograph on disorders of hemoglobin synthesis and pregnancy. Dr. Perkins also completed a study demonstrating the lack of significance of the anti-Lewis antibody in the serum of many pregnant women.

Drs. Edward Bowe, Saad El-Hawary, William Blanc (Pediatrics) and Anne-Christine Homberger (Pediatrics) have begun an investigation of the incidence of significant fetal-maternal bleeding associated with unexplained stillbirths. Dr. Bowe completed a study of fetal gestational age and amniotic fluid creatinine concentrations.

Labor and Delivery

Dr. Steer and Dr. Thomas McCann have begun a study of the influence of intravenous alcohol and intravenous magnesium sulfate in the control of premature labor.

The Fetus and the Newborn

Dr. Vincent J. Freda and Dr. John G. Gorman continue the clinical trial of RhoGAM in Rh negative mothers at risk. Follow-up studies are being carried out on the 497 mothers already in the trial.

Testing of Clare's EluA-Nierhaus-Betke modification of the Kleihauer-Betke stain has been carried

out in the Rh Research Laboratory. This provides a rapid and very satisfactory method for detection of fetal cells. With this simplified test (which eliminates the need for controlled temperature elution) it is now possible to screen rapidly all mothers where massive feto-maternal hemorrhage is suspected. The Rh negative mothers at risk who have had such transplacental hemorrhages can thus be identified and treated with adequate doses of RhoGAM.

Dr. Freda and Dr. Bowe are continuing the salvage of RH affected babies through use of the Liley closed transabdominal method of intrauterine transfusion.

Drs. Michael Levi and Mandl and Mr. John Manahan have continued their investigation of the fetolytic agent, now named Resorptin, which had previously been shown to cause complete resorption of mouse embryos when injected I.V. into pregnant mice.

Drs. Suzuki and Adamsons have continued studies of pharmacologic effects of nicotine upon the fetus and the mother and transmission of nicotine across the placenta in the Rhesus monkey in collaboration with Drs. Terusada Horiguchi, Arsenio Comas, Eberhard Mueller-Heubach, Hisayo Morishima (Anesthesiology), and Miss Ligia O'Brien. Drs. Horiguchi, Suzuki, Comas, Ann Milic, Morishima, Robert Baratz (Anesthesiology), Stanley James (Pediatrics) and Adamsons have completed the study of the effect of ethanol upon uterine contractions and acid-base state of the fetus in the Rhesus monkey. Drs. Adamsons and Suzuki reviewed the effect of adrenocorticosteroids upon the fetus when they were administered to the mother, paying particular attention to the fetal adrenal function. Drs. Suzuki, Horiguchi and Adamsons have completed a radioangiographic study of the intrauterine fetal circulation in the Rhesus monkey. In collaboration with Drs. Takashi Okagaki (Pathology) and Ralph Richart (Pathology), Drs. Suzuki, Horiguchi and Adamsons conducted *in vitro* measurements of oxygen consumption of fetal tissues under various conditions in the Rhesus monkey and guinea pig.

Drs. Adamsons, Horiguchi, Suzuki, Comas-Urrutia, Mueller-Heubach, and Morishima (Anesthesiology) have completed a study dealing with the pharmacologic effects of nicotine upon cardiovascular performance and acid-base state of the fetal monkey.

Drs. Adamsons, James (Pediatrics) and Robert A. Baratz (Anesthesiology) have completed a study examining the merits of ethyl alcohol in the treat-

ment of premature labor in the Rhesus monkey.

Dr. Ann M. Boyer Milic in collaboration with Dr. Adamsons completed a study dealing with the duration of gestation of anencephalic fetuses.

In collaboration with Dr. Ronald E. Myers (Director of the Laboratory for Perinatal Physiology National Institute of Neurological Diseases and Stroke, San Juan, Puerto Rico) Drs. Adamsons and Mueller-Heubach have initiated a study which examines the effect of reduced energy requirement of the fetal Rhesus monkey upon the duration of gestation. Dr. Mueller-Heubach is also developing an experimental model in the Rhesus monkey to measure oxygen consumption of the brain during partial asphyxia. In conjunction with Drs. Figueroa-Longo and Arsenio Comas (Department of Obstetrics and Gynecology, University of Puerto Rico) a clinical study is in progress which evaluates the effect of maternal posture upon fetal tolerance to labor and delivery.

Neoplastic Disease

Members of the Division of Obstetrical and Gynecological Pathology under the direction of Dr. Ralph Richart have continued their investigation of early cervical neoplasia and other abnormalities of the female reproductive system. This work is described in the report of the Department of Pathology.

In the Delafield Research Laboratories, Dr. Ines Mandl, Dr. Levi and Dr. Stephen Keller have continued studies of specific antigens in gynecological tumors.

In collaboration with Dr. Charles Fox (Surgery) Dr. Mandl has studied the effect of silver derivatives of nucleotides on animal tumors. Other potential metabolic inhibitors of cancer growth were tested by Dr. Mandl and her associates. Preparations of *E.coli* asparaginase were tried against Walker 256 carcinosarcoma and monocytic leukemia strain R 3149 in rats. Drs. Mary S. Parshley, Carlton Blackwood and Mandl found a methanol extract of adult connective tissue previously shown to affect *in vitro* cultures of papillary serous cystadenocarcinoma of the ovary to cause regression of Flexner-Jobling rat tumors. Metabolic studies of regressing and non-regressing Flexner-Jobling tumors and fast growing and slow growing human lung tumor lines established in tissue culture were continued by Drs. Parshley, Blackwood and Mandl and Miss Claire Ziegelmaier with special emphasis on differences in glucose consumption and lactic acid production.

Drs. Mandl and Keller initiated a study designed

to correlate collagenase production with invasiveness of tumor tissue.

Clinical Studies

Dr. Henry Clay Frick, II, in collaboration with Dr. George Hyman (Medicine) continues to evaluate various chemotherapeutic agents in the treatment of advanced ovarian cancer. The drugs being used at present are vincristine, amethopterin (Methotrexate), Actinomycin D and phenylalanine mustard (Alkeran).

Drs. Frick and McCann continue studies on the origin and rate of ascitic fluid formation in ovarian carcinomatosis.

Drs. Frick and Raymond McCaffrey are continuing to review the results and complications of radical hysterectomy.

Dr. Frick is preparing the tables showing results of cancer of the cervix and vagina for inclusion in Volume 15 of the Annual Report on the Results of the Treatment of Carcinoma of the Uterus and Vagina (Stockholm) which is published under the patronage of the International Federation of Gynecology and Obstetrics.

Dr. Frick and Dr. Saul B. Gusberg, Professor of Obstetrics and Gynecology at Mt. Sinai Hospital, are preparing the fourth edition of *Gynecologic Cancer* by Dr. James A. Corscadden, first published in 1951.

Dr. Robert S. Neuwirth continues his work with laparoscopy. It has been used in the diagnosis of various pelvic disorders including possible ectopic pregnancy, infertility, and questionable pelvic masses. The laparoscopic technique has now been expanded to include the performance of biopsies and tubal sterilizations.

Dr. Robert Hall has concluded the fourth year of a five-year study of birth control among some 8,500 Sloane Hospital clinic patients. In addition, with the assistance of Dr. Susan Williamson, he has completed the sixth year of a 10-year study of some 4,000 women fitted with intrauterine contraceptive devices.

Clinical Report

During the year 1969 the number of clinic visits rose very slightly. Much of this was due to an increased number of visits in the Obstetrical Clinic, but the visits to the Gynecological Clinic have fallen off in a very distinct way. The total number of deliveries has again diminished. The perinatal mortality, which reached an all time low in 1968, has again risen to a level which is proportional to the level achieved in the last several years. On the

Private and Semi-Private Service there was another rise so that again this Service is above the Ward Service. This is due again to the special facilities for dealing with Rh problems. The perinatal mortality rate continues at a fairly steady level. The perinatal mortality for babies born at term is very low. The number of operative deliveries has risen somewhat for the year 1969. This rise, however, is within the range generally seen from year to year. The number of gynecological operations has diminished. The decrease on the Ward Service remains

in effect probably because of the effect of the Medicaid and Medicare Programs. The number of cancer patients followed in the Tumor Clinic remains at a very high level. This is an extremely useful function and the staff is to be commended for it. The five-year results in primary cases of gynecologic cancer show a very real improvement for those cases treated during the year 1963. This is particularly noticeable in cases of Stage I cancer of the cervix and in the cases of cancer of the ovary. It is hoped that this improvement will continue.

TABLE 1
CLINIC VISITS

	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Obstetrical	27,026	25,383	25,863	26,041	29,333
Gynecological	21,219	19,276	20,309	21,398	18,178
Total	48,245	44,659	46,172	47,439	47,511

TABLE 2
VIABLE DELIVERIES

	<u>1956-1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
	<u>Average</u>	<u>Average</u>	<u>Average</u>	<u>Average</u>	<u>Average</u>
Ward	2,993	3,093	3,082	3,145	3,072
Semi-Private	756	672	658	631	671
Private	730	642	655	616	584
Total	4,479	4,407	4,395	4,392	4,327

TABLE 3
PERINATAL MORTALITY

	<u>1956-1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
	<u>Average</u>	<u>Average</u>	<u>Average</u>	<u>Average</u>	<u>Average</u>
Ward	25.2/M	20.2/M	23.0/M	15.6/M	20.6/M
Private and Semi-Private	18.0/M	22.8/M	24.3/M	18.5/M	29.4/M

M — per thousand *viable births* (more than 1000 grams)

TABLE 4
RELATION OF BIRTH WEIGHT TO PERINATAL MORTALITY

<u>Weight in Grams</u>	<u>Total Births</u>	<u>Total Perinatal Deaths</u>	<u>1969 Per Cent Perinatal Mortality</u>
500 - 1,000	52	49	94.0
1,000 - 1,500	58	35	60.0
1,500 - 2,000	92	23	25.0
2,000 - 2,500	273	9	3.3
Over - 2,500	3,898	31	0.8
Total	4,373	147	3.4

TABLE 5
OPERATIVE DELIVERIES

	<i>Ward</i>	<i>Private & Semi-Private</i>	<i>Total</i>
Cesarean Sections	270(8.8%)	173(15.0%)	443 (10.3%)
Primary	162	104	266
Repeat	108	69	177
Mid Forceps	169	81	250 (5.8%)
Low Forceps	809	384	1,193 (27.6%)
Breech Deliveries	87	31	118

TABLE 6
GYNECOLOGIC OPERATIONS

	<i>1956-1965</i>	<i>1966</i>	<i>1967</i>	<i>1968</i>	<i>1969</i>
	<i>Average</i>				
Ward	934	734	750	810	730
Semi-Private	583	578	605	565	535
Private	441	408	429	500	492
Total	1,958	1,720	1,784	1,875	1,757

TABLE 7
CASES OF GYNECOLOGIC CANCER TREATED OR UNDER OBSERVATION
DURING EACH OF YEARS FROM 1957-1969

	<i>Total Patients Followed</i>	<i>The Presbyterian</i>	<i>The Francis Delafield</i>
	<i>Ward</i>	<i>Private</i>	
1957	1,950	850	404
1958	1,883	853	418
1959	1,945	920	407
1960	2,248	1,084	468
1961	2,384	1,180	472
1962	2,601	1,319	481
1963	2,851	1,527	541
1964	3,198	1,752	594
1965	3,633	2,015	688
1966	3,581	2,282	449
1967	3,577	2,301	375
1968	2,396	1,281	373
1969	2,110	1,045	248

TABLE 8
FIVE YEAR RESULTS IN PRIMARY CASES OF GYNECOLOGIC CANCER
TREATED AT THE PRESBYTERIAN HOSPITAL 1954-1963

	<i>1954 through 1962 inclusive</i>			<i>1963</i>		
	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>
Cancer of Cervix Uteri						
Stage I	225	166	73%	38	33	87%
Stage II	168	84	50%	15	8	53%
Stage III	57	19	33%	3	1	33%
Stage IV	24	0	0%	5	0	0%
Total of all cases	474	269	56%	61	42	69%
Cancer of Corpus	406	257	60%	41	24	58%
Cancer of Ovary	303	104	34%	24	11	46%

1969 Publications

Obstetrics and Gynecology

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Ophthalmology

A. GERARD DE VOE

Harkness Professor and Chairman of the Department · Director of Service

The major event of the year 1969 has been the opening of the new wing to the Edward S. Harkness Eye Institute. The upper six floors are devoted to research activities, the two lower floors are for clinical use and have been integrated into an associated renovation of the ground floor of the old building. The X-ray Department, Children's Clinic and Tumor Clinic have been re-situated. This permits consolidation of all of our activities in one geographic area. In the clinical area examining rooms are set up as complete offices in which residents and attending staff will treat patients in the same manner as they are handled in private offices. Patients will be seen all day long instead of in the afternoon as is currently practiced. The ready availability of attending help and advice will be greatly facilitated by the proximity of the new clinic to the wards and offices in the Eye Institute.

We are most appreciative of the help provided by our many friends whose efforts made this possible. It must be mentioned that the initial stimulus was provided by Research to Prevent Blindness, Inc. which continued to supply advice and support throughout the fund raising campaign. Similarly we could not have reached our goal without the most generous help of Mr. Malcolm P. Aldrich, Mr. and Mrs. Frank Altschul, Amerada Petroleum Corporation, The Max Ascoli Fund, Inc., The Winfield Baird Foundation, Mr. Walston S. Brown, The California Texas Oil Corporation, Dr. Charles J. Campbell, Dr. Frank D. Carroll, The Robert Sterling Clark Foundation, The Commonwealth Fund,

The Cremona Fund, Dr. Robert M. Day, Dr. Andrew de Roeth, Jr., Dr. Arthur Gerard DeVoe, Dr. Anthony Donn, Dr. & Mrs. John H. Dunnington, Dr. Arnold W. Forrest, Mr. and Mrs. Henry J. Gaisman, Mr. Lester T. Hope, Mrs. Hildegard Jacobson, Dr. Ira S. Jones, Dr. Philip Knapp, The Albert & Mary Lasker Foundation, Inc., The Estate of Jane Lennon, Dr. George R. Merriam, Jr., Dr. Charles A. Perera, Mr. Stephen Phillips, The Quaker Hill Foundation, Mr. Paul Raibourn, Dr. Algernon B. Reese, Dr. Ellen F. Regan, Research to Prevent Blindness, Inc., Mr. Morris A. Schapiro, The Seeing Eye, Inc., The Alfred P. Sloan Foundation, Dr. Harold F. Spalter, The Seth Sprague Educational & Charitable Foundation, Dr. & Mrs. Jules Stein, Mr. James Storer, The Myron & Anabel Taylor Foundation, Inc., Texaco Inc., The Edmund B. Thornton Foundation, Inc., The United States Public Health Service, The Estate of Mabel Warren, Mr. & Mrs. Alfred N. Wheeler, Dr. and Mrs. Maynard C. Wheeler.

Staff Changes

With regret we report the retirement of Dr. J. Vincent Flack who, beginning with a residency in 1933, has faithfully served the department for 36 years. Dr. Milton Campbell has joined the staff as Assistant in the out-patient department. The research group has been strengthened by the addition of Dr. Harlow Fischman, a geneticist, Dr. Joe Gilbert Hollyfield, an embryologist, Dr. Takeo Iwamoto, an ophthalmologist with extensive experi-

nce in electronmicroscopy, Dr. Mary Moller, a biochemist, Dr. Samuel G. Nord, a neurophysiologist, Dr. Arthur Schneider, a biochemist; and Dr. Tadasu Tokumaru, an ophthalmologist with special training in anatomy. Dr. Hermann Gernet of the University of Munster, West Germany, spent four months as visiting professor working with Dr. D. Jackson Coleman on ultrasound.

Teaching

The reduction of teaching hours allotted to the specialty groups has resulted in each third year student receiving five one-half day periods of instruction in the department. Our objective is to offer an over-all but necessarily inadequate review of the specialty to the undergraduate. Our major teaching program is at the postgraduate level.

Statistics

During the year 3,934 patients were hospitalized or 27,817 patient days, approximately the same as 4,029 patients and 29,055 patient days during the previous year. There has been a slight decrease in patient day occupancy associated with an increase in the number of operative procedures performed, reflecting improvements in technique and post-operative management of surgical conditions. Out patient visits of 4,861 individuals does not include visits to the Children's Clinic. This subunit, supported in part by Fight for Sight, directed by Dr. Philip Knapp and Miss Sally Moore, attracted 1,665 patients. In the Eye Pathology Laboratory, supervised by Dr. George Howard 519 specimens were processed. In the Clinical Pathology Diagnostic Laboratories of the Eye Institute, under the supervision of Dr. Emil Wirostko, 15,725 examinations were carried out. The X-ray Department has worked at a disadvantage during the past year because of the closure of the facilities in the old Eye Institute. With the reopening and with Dr. Stephen Trokel's close affiliation with the Radiological Department of the Neurological Institute, continued rapid expansion and development of this area is anticipated. The John M. Wheeler Library, supervised by Miss Lillian Hansen, now contains 3,689 volumes and 4,864 periodicals pertaining to the eye. Mr. Emil G. Bethke, in recognition of his contribution to the field of medical illustration, has been invited to submit some of his work to the permanent collection of the Archives of Medical Visual Resources at Harvard Medical Library.

Research

Dr. George K. Smelser, first incumbent of the newly created Malcolm P. Aldrich Research Pro-

fessorship of Ophthalmology, directs the overall research program, an administrative task of considerable magnitude. Working with seven fellows, his research efforts have been directed to a number of areas:

Dr. Luc Missotten, studying the developing rabbit retina, noted that typical synaptic complexes had not yet developed in the bipolar cells at 15 days of age. He also studied the intraretinal neuronal connections in the adult animal.

Mr. Thomas Weingeist followed the development of the entire ciliary complex of the rabbit from the 19th day to the fourth postnatal week and correlated the onset of aqueous humor production with anatomical development.

Dr. Irwin Beitch completed his study of the corneal epithelium in rats made xerophthalmic by experimental removal of the lacrimal gland and those keratinized by deficient vitamin A diet.

Dr. Nobuhiko Matsuo has studied the electronmicroscopic structure of the growing and regressing transitory intraocular vasculature of the embryonic eye.

As Visiting Professor from Prague, Dr. Frantisek Vrabec has been active in adapting his replica and pseudo replica techniques to electron microscopy. He has made cytological studies of corneal structures after *in situ* precipitation of the corneal mucopolysaccharides. In addition to pursuing his life long interest in the retina, he has worked with Dr. Richard Darrell on herpetic lesions of the rabbit cornea and with Drs. Smelser and R. Linsky Farris concerning functional changes in the cornea after the application of keratoprostheses.

Dr. Hajime Inomata has completed his studies on fine changes in the corneal endothelium during graft rejection. He has studied experimental immuno-keratitis, the regeneration of Descemet's membrane and endothelium in wound repair, and has developed a technique of radio-autography in the electron microscopic study of regeneration of retina following light coagulation.

With Miss Victoria Ozanics, Dr. Smelser has completed a study of the differentiation of the trabecular meshwork in embryonic monkey eyes.

Dr. Takeo Iwamoto, an ophthalmologist widely experienced in electronmicroscopy, has studied the changes found in tissues of such corneal disorders as Fuchs' dystrophy, keratoconus, Hurler's disease, and demodex folliculorum infestation. In the last instance this is the first demonstration of the possibility of this mite being a vector for infectious organisms. The work was done in collaboration with Dr. Frank English.

Dr. Wladyslaw Manski, in collaboration with Drs. Coronacion Martinez and Sachiko Hamada, pursued studies on the comparative antigenic composition of separate corneal tissues and sclera. With Dr. Harry Kessler and Miss Margaret Cubberly he noted that the ocular pathology developing in autoimmune mice was analogous to those changes observed in Sjogren's syndrome. Studies on the response of normal and regenerating cornea to anti-cornea serum with Drs. Gabriele Ehrlich and Frank Polack were completed supporting the conclusion that the inflammation observed in regenerating corneas in response to anti-cornea sera is basically a reaction of cell bound corneal antigens. With Dr. Albert York he has concluded studies on the immunochemical comparison of normal and cataract lenses. The data indicate that complete loss of synthesis of normal lens proteins does not occur in senile cataract but that a decrease of some normal lens proteins does.

Dr. Abraham Spector has continued his studies on the structure of alpha crystallin in the lens. He has begun an investigation on the mechanism of polypeptide chain initiation, and has started a study on the metabolism of the cornea. In order to carry out his lens studies, it has been necessary to develop methods of securing and isolating large amounts of purified lens protein and its subunits. He has succeeded in isolating quantities of highly purified alpha crystallin and is presently attempting to similarly isolate the subunits.

Recent work having suggested that enzymes from the corneal epithelium may be responsible for aseptic dissolution of the cornea, Dr. Ethel Anderson has been studying the proteolytic and mucocollagenolytic capacities of corneal tissue which could be of considerable importance in corneal wound healing, ulcer development, keratoconus and possibly myopia.

Dr. Kenneth Eakins, in collaboration with Dr. Barbara Beitch, has continued to explore the effects of prostaglandins on intraocular pressure. He has concluded that the production of local ocular vasodilation and increased permeability of the blood aqueous barrier accounts for much of the effect of prostaglandins on intraocular pressure. His experiments indicate that the prostaglandins may well be involved in such pathological states as uveitis and certain types of glaucoma. With Dr. Sultan M. M. Karim, Senior Lecturer in Pharmacology at Makerere University, Kampala, Uganda, he has sought a true antagonist for prostaglandins. With Dr. Clyde O. Lord (Anesthesiology) he has studied the effect of various compounds which

antagonize the re-uptake of catecholamines into the sympathetic nerves.

A study of the synaptic connections in the carp retina at the electronmicroscopic level has been carried out by Dr. Paul Witkovsky. Centrifugal nerves were found in the inner plexiform layer. Studies of these fibers and physiological investigation of their function is underway.

Dr. Laszlo Bito's laboratory of ophthalmic physiology has been engaged in a study of the chemical composition and homeostasis of the extracellular fluids of the central nervous tissues. Evidence was found that both the blood-brain and blood-retinal barriers have an active secretory function.

In the ultrasound laboratory, directed by Dr. D. Jackson Coleman, ultrasonic techniques have been evaluated in terms of diagnosis, therapeutics and physiologic measurements employing both the A and B scan techniques. A new ultrasonic display technique, M-scan, was devised and reported. This method facilitates recording of dynamic changes in the eye by which it is hoped that changes in the choroidal circulation can be measured objectively. Biometric studies using ultrasound to document growth changes in myopes have been carried out.

The Corneal Center has been hampered during the past year by the loss of two key figures, Dr. Albert Ketler and Dr. Saiichi Mishima, both of whom have now been replaced. In addition to that described above by Drs. Smelser, Manski, Spector and Anderson, both basic and clinical work has evolved from the Center. Dr. Zacharias Dische has continued research on the insoluble collagen of corneal stroma. Dr. Richard Darrell has been attempting to demonstrate the persistence of herpes simplex virus in the corneal stroma and is observing the microscopic morphology of such virus corneal infections as herpes simplex and adenovirus, Types 2, 4, 8, vaccinia, and Newcastle's Disease virus.

Dr. R. Linsky Farris has continued his interest in corneal physiology with particular reference to those changes occurring during contact lens wear. The use of the epikerato prosthesis or glued on contact lens has been explored. It is the feeling that this has relatively little clinical use but may be of value as a tool in the study of metabolic disorders of the cornea.

Dr. Frank Hoesle has carried on a productive program in the study of the storage of corneal donor material, the effects of calcium free KEI perfusion on the rabbit corneal endothelium and on the reaction of the animal cornea to tissue adhesives and epikeratoprostheses.

The ten year program of studies on artificial corneas carried out by Drs. Herando Cardona, A. Gerard DeVoe, and Ramon Castroviejo has reached the point where a practical prosthetic device has been devised and employed sufficiently to warrant its use in those individuals who are blind because of corneal changes not remediable by ordinary surgical maneuvers. This includes a large group of individuals injured by chemicals and those in whom previous operative procedures have failed.

In the Knapp Memorial Laboratory, under the direction of Dr. Charles J. Campbell, a variety of diseases has been treated with primary emphasis directed towards the management of retinal detachment, retinal vascular and degenerative macular syndromes, diabetic retinopathy and retinal tumors, as well as inflammatory diseases of the posterior segment. Experimental evaluation, both clinical and histological, of the various ocular lasers continues. Fluorescein photographic techniques and angiography are being developed and animal experiments are in progress with new plastic materials which may be of value in human retinal surgery of the future. Dr. Richard Banyard and Dr. Kimiharu Noyori, with the assistance of Professor Elwin Marg of the University of California, have developed a technique of inserting microelectrodes into the retina under ophthalmoscopic visualization permitting the recording of electric potentials either from the ganglion cells or the nerve fiber layer. Drs. Richard Bell and Noyori are exploring the effects of the Xenon Arc and Cryotherapy coagulations on the retinal vasculature of experimental animals.

In the Pupillographic Laboratory, Dr. Irene Loewenfeld has neared completion of the encyclopedic handbook of the pupil, has completed a study on the pupillary actions of children with cystic fibrosis and is pursuing the population study of pupillary differences and pharmacological reactions noted in previous years.

In the Neuro-ophthalmological Laboratory, directed by Dr. Robert S. Jampel, studies on the basic physiology and anatomy of the ocular motor system are in progress; this year's research being primarily concerned with ocular motor torsion. Dr. Jampel also organized and directed a three day neuro-ophthalmology postgraduate course which was attended by 160 physicians. The department also took part in a neuro-radiology course the final day of which was devoted to ophthalmologic neuro-radiology under the direction of Dr. Ernest H. Wood, Dr. Guy D. Potter, and Dr. Stephen Trokel. This was attended by 480 individuals.

The Uveitis Laboratory has been unusually ac-

tive this year under the leadership of Dr. Emil Wirostko. Using the FADF technique he has observed that approximately ten per cent of patients with chronic uveitis of undetermined etiology have spirochetes within their eyes. He has further discovered that many patients with uveitis harbor a unique and previously undescribed micro-organism which animal studies have shown to be pathogenic and causative of widespread systemic chronic inflammatory disease. He is now carrying on studies to identify this organism and to develop methods of therapy.

Dr. George R. Merriam, Jr. continues his study on the relative sensitivity of the young and adult mammalian lenses in rats. No marked difference has been demonstrated between one day old, one week, three and one-half weeks and 16 week old animals. He is starting additional investigations with Dr. Dische and Dr. Spector in an attempt to relate the clinical changes with chemical changes in the lens capsule and lens protein.

During the past year 350 patients have been treated by Dr. Francis L'Esperance with argon laser photocoagulation. It is the belief that effective treatment for histoplasmic chorioretinitis, toxoplasmic chorioretinitis, central serous choriopathy, macular cysts, and microcystic disease of the macula has been attained sufficient to warrant further study. Animal work has suggested that certain glaucoma procedures may be accomplished with this instrument.

In the Contact Lens Clinic, Dr. John Espy has been evaluating new plastics for contact lenses. In addition, the evaluation of the scleral contact therapeutic lens continues.

In the Tumor Clinic, supervised by Dr. Algernon B. Reese and Dr. Robert M. Ellsworth, approximately 800 cases were examined under anesthesia, a wide variety of clinical conditions being observed. Emphasis is on the study of retinoblastoma and other ocular and orbital tumors. With Dr. David Kitchen, the pedigrees of 55 families with retinoblastoma were carefully studied and estimations of the penetrance in various clinical situations were recalculated. Attempts to identify the chromosome carrying the abnormal gene for retinoblastoma and attempts to isolate tumor-specific or retinal-specific antigen to aid in the identification of tumor cells in extraocular sites are underway.

In the Optic Nerve Clinic, Dr. Frank D. Carroll has seen many unusual optic nerve problems. He has reported on 22 patients from the Caribbean area with bilateral optic atrophy probably on the basis of nutritional deficiency.

Dr. Andrew de Roeth has compared the effects

of cryosurgery and diathermy on the ciliary body in the treatment of glaucoma. He has concluded that both methods lower the intraocular pressure by decreasing the aqueous inflow but that cryosurgery is the safer method because of the difference in the complications. This is probably due to the integrity of the sclera in cryotherapy as opposed to the perforations with leaky puncture wounds which occur with diathermy.

Dr. Max Forbes has collaborated with Dr. Kenneth Eakins in studies concerning the potentiation of epinephrine in the management of glaucoma, with Dr. Francis L'Esperance in the argon laser photocoagulation in glaucoma, and with Dr. Richard Lennon in studying the steroid response in angle recession glaucoma.

Resident activity in the research programs continue. Dr. Frank Grady has studied the electron spin resonance of melanin formation and has conducted comparative studies of the melanin of the pigment epithelium of the iris and choroid in bovine eyes. He has further investigated the clinical use of the cyanoacrylate adhesives for the closure of perforated corneal injuries. Dr. Myles Behrens has completed and submitted his thesis for the Doctor of Medical Science degree on the immunochemical relationship and comparative immunopathogenesis of lens albuminoid and crystallines. Dr. William James has worked in Dr. L'Esperance's laboratory investigating the applications of the argon laser in

the treatment of vascular diseases of the eye with particular emphasis on diabetic retinopathy. Dr. Richard Lennon has continued his studies on the diurnal variation of the intraocular pressure. Dr. G. Randolph Kelly investigated changes in vitreal temperature with the scleral probe application. Dr. Richard Banyard has inserted microelectrodes intraretinally before and after ruby laser photocoagulation. Dr. Randolph Whitfield has found organisms, particularly *Treponema pallidum*, in the aqueous humor of patients with uveitis. Dr. Lance Redler is studying serial sections of globes to determine the effect on patients survival of choroidal invasion by retinoblastoma. Dr. Robert Jack is actively engaged in electronmicroscopic studies of pathologic corneal conditions.

We record with gratitude the many contributions of generous friends which enable us to carry out research endeavors in many widely disseminated areas. In particular we thank the American Optical Company, Robert Sterling Clark Foundation, Marie Heye Clemens Fund, Geigy Pharmaceutical, Mary W Harriman Fund, The John A. Hartford Foundation, Inc., Mr. Sidney Hoffmann, Dunlevy Milbank Foundation, National Council to Combat Blindness Inc., National Foundation, Research to Prevent Blindness, Inc., I. Schwind Foundation, Inc., Alfred P. Sloan Foundation, Seth Sprague Educational and Charitable Fund, The Seeing Eye, Inc., and United States Public Health Service.

1969 Publications

Ophthalmology

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Orthopaedic Surgery

FRANK E. STINCHFIELD

Professor and Chairman of the Department • Director of Service

During the past year Dr. Alice L. Garrett joined the staff as Associate Clinical Professor of Orthopaedic Surgery and Chief of Orthopaedic Surgery at the New York State Rehabilitation Hospital. Dr. S. Ashby Grantham was promoted to Associate Professor of Clinical Orthopaedics and Dr. Irwin Clark, assigned to the Department of Orthopaedic Surgery, was promoted to Professor of Biochemistry. Drs. L. Arne Skilbred, Joseph P. Zawadsky and Eric K. Zitzmann, Assistant Attending Orthopaedic Surgeons, Vanderbilt Clinic, and Dr. Joel D. Weinstein, Senior Annie C. Kane Fellow, were appointed Instructors in Orthopaedic Surgery.

It is with deep sorrow that we record the death during the past year of Dr. William von Lackum, who retired in 1958 after twenty-eight years of devoted service to The New York Orthopaedic Hospital. Dr. von Lackum excelled in the field of scoliosis and was one of the pioneers in this field. His boundless energy, enthusiasm and dedication were an example to the entire staff of the Hospital.

Dr. George B. Ambrose was appointed to the Committee on Trauma and the local Committee on Applicants of the American College of Surgeons, as secretary, Section of Orthopaedics, and as a founder member of the 1969 Committee on Medical Engineering, Section on Bio-Medical Engineering of the New York Academy of Medicine. Dr. C. Andrew L. Bassett was elected president of the Board of Trustees, Laboratory of Bone Physiology, Institut Calot, Berck-Plage, France. Dr. Robert E. Carroll

was elected vice president of the Association of Bone and Joint Surgeons. Dr. Sawnie R. Gaston was elected president of the American Association for the Surgery of Trauma. Dr. Grantham spent two months in England, having been awarded a Traveling Fellowship by the American Orthopaedic Association. Dr. D. Keith McElroy was elected treasurer of the Canadian Orthopaedic Association. Dr. Harrison L. McLaughlin was elected to honorary membership in the American Academy of Orthopaedic Surgeons.

Dr. Charles S. Neer served as Visiting Professor at McGill University in Montreal, Canada, and at the University of Texas Medical School in San Antonio. He was appointed to The American Board of Orthopaedic Surgery as an alternate member for the American Orthopaedic Association, to the Committee on Trauma of the American College of Surgeons, and as the American Orthopaedic Association representative to the National Health Program on Orthopaedic Surgery.

Dr. Charles T. Ryder has organized a computer-based system to optimize the use of a pediatric orthopaedic hospital facility. The OADS (Orthopaedic Admissions/Discharge Support) System has been designed, programmed and tested using the computer facilities of the Presbyterian Hospital. It provides daily a listing of patients in hospital with their anticipated dates of discharge, a "waiting list", a list of patients scheduled for elective admission in the next week, and a forecast of occupancy by

age and sex groups for the following four weeks. By relating the waiting list and the forecast it should be possible to avoid the wide fluctuation in occupancy previously experienced. This model may serve as a prototype for a modern general system of hospital admission/discharge procedures.

Dr. Ryder, with Dr. William R. Kennedy, a member of our resident staff, is working on the development of a radiographic method for measuring tibial torsion; and with Dr. F. Gordon, a member of the resident staff at the New York State Rehabilitation Hospital, on the development of a radiographic method for measuring spatial orientation of acetabulum.

Dr. Marvin L. Shelton was elected treasurer of the Medical Board at the Harlem Hospital Center.

Probably the greatest change in teaching this year occurred in the complete reorganization of our commitments to undergraduate students.

In the first year we now have three anatomy correlation clinics for the class as a whole, together with a one hour period on the histology of bone given by Dr. Bassett, and a one hour period on mineral metabolism given by Dr. Irwin Clark.

In the second year, we have five lectures to the entire class, covering orthopaedic histories, physical examination of the upper extremity, the axial skeleton, the lower extremity and posture and gait. The present class of 128 students will be divided into quarters of 32 each; each quarter being divided into 4 sections of 8 students each. During 16 half day sessions, requiring four instructors for each session, the same material will be covered as in the one hour lectures. The department will also participate in sessions on metabolic bone disease and wound-fracture healing.

In the third year there are 24 groups of 6 students each for a period of approximately 9 days. Each group is assigned an instructor who has the primary responsibility for all teaching personnel assigned to him, evaluating their effectiveness. His goal is to provide the student with a broad overall view of the scope of orthopaedics and to teach the principles of major conditions to be seen in a career as a primary physician. Senior residents on the staff are brought into the teaching program to lecture-demonstrate assigned recurring problems. They lecture on genetics and orthopaedics.

In the future, the fourth year will be devoted to clerkships and we feel that the department is able to make available an excellent internship-type of training in orthopaedic surgery. For the first time, active participation in our undergraduate teaching is being afforded by Roosevelt, St. Luke's, Harlem and

the New York State Rehabilitation Hospitals. This broadens our teaching capacity and we are very grateful.

Although all undergraduate teaching commitments in the department are a great deal heavier than ever before, our entire faculty feels it worthwhile and are anxious to participate.

One of the chief advancements in surgical technique on the Orthopaedic Service has been the institution of the low friction type of hip arthroplasty for patients with totally destroyed hips. The Food and Drug Administration has granted us the privilege of using methyl methacrylate to cement the prosthesis and polyethylene acetabulum into place. A careful prospective study is being carried out in this field by Drs. Nasseroddin S. Eftekhar and Kenneth M. Kurokawa of our staff.

During 1969, 3,015 patients were admitted and 2,483 operative procedures were carried out.

<i>Classification</i>	<i>Number of Procedures</i>
Back	153
Upper Extremity	872
Lower Extremity	683
Hip	472
Knee	266
Miscellaneous	37

During the past year, there were 31,595 clinic visits and 1,553 patients returned to the follow-up clinic.

Under the direction and supervision of Dr. Austin D. Johnston, (Pathology, assigned to our department), routine diagnostic service was accorded 323 patients and 1,268 consultations were carried out in the Orthopaedic Pathology Laboratory.

The New York State Rehabilitation Hospital

The department has welcomed the appointment of Dr. Garrett as Chief of Orthopaedic Surgery at the State Rehabilitation Hospital. Coming from Rancho Los Amigos Hospital, Downey, California, Dr. Garrett has had broad experience in the orthopaedic management of permanently handicapping disorders, and her arrival at Haverstraw strengthens the service there.

The affiliation of Columbia University with the State Rehabilitation Hospital has now been fully implemented. Two residents from Presbyterian Hospital and one from the Orthopaedic Service at Harlem Hospital Center are assigned to the State Rehabilitation Hospital where they will work under the supervision of a full-time senior resident and the attending staff. Undergraduate students also spend some time at that institution during the period they

are assigned to our department. These arrangements provide unique opportunities for training and study in the chronic disabling disorders of children and adults—disorders which increasingly are creating challenging medical and social problems throughout the country.

Harlem Hospital Center

The most noteworthy event in the past year was the opening of the new Harlem Hospital Tower Building for patient use on September 5, 1969. The building is now completely occupied with approximately eight hundred (800) beds for in-patients as well as facilities for administrative, nursing, social service, dietary and out-patient rehabilitation functions.

The Orthopaedic Service has 55 adult beds, 15 plus adolescent and pediatric beds and 13 new operating suites of which 9 are currently operative. Our service is now completely equipped to perform all standard operative procedures as well as advanced equipment for the management of unusual fractures. The out-patient department continues to be located in the Pediatric Building. Out-patient visits at the six weekly orthopaedic clinics average 900 per month. The Orthopaedic Service continues to provide first echelon care for all patients presenting in the Emergency Room with musculoskeletal problems on a twenty-four hour basis. These treatments average over 200 per month.

During 1969, Dr. George S. Price, Jr. and Dr. Kumar S. Reddy joined the staff of the Orthopaedic Service as Assistant Visiting Surgeons. There are now six residents assigned to the Orthopaedic Service at Harlem Hospital Center.

The fourteenth annual postgraduate course in orthopaedic surgery and pathology was attended by 145 orthopaedic surgeons from throughout the country. That part of our course devoted to orthopaedic pathology, under the direction of Dr. Johnston, continues to attract many specialists, including radiologists and pathologists as well as orthopaedic surgeons. The first annual postgraduate course on scoliosis, conducted by Dr. Hugo A. Keim, with the able assistance of many visiting specialists in this field, was attended by 64 orthopaedic surgeons.

Dr. Ian Macnab, Assistant Professor of Surgery, University of Toronto, and Chief of Orthopaedic Surgery at Wellesley Hospital in Toronto, Canada, served as Visiting Professor for the week of February 9th.

The forty-third annual reunion of the Alumni Association of The New York Orthopaedic Hospital held on April 24th and 25th was attended by an

exceptionally large number of members and guests. At the second day's session, held at Harlem Hospital Center, Dr. Walter P. Blount, Clinical Professor Emeritus of Orthopaedic Surgery at Marquette School of Medicine, presented the Twelfth Annual Alan DeForest Smith Lecture on fractures in children. Dr. Paul J. Strassburger was elected president and Dr. Ambrose was elected secretary-treasurer.

Contributions for construction of The New York Orthopaedic Hospital Alumni Auditorium have reached a total of \$174,165. Actual work on what will be an excellent Auditorium has been delayed due to the fact that because of insufficient funds, the Medical Center has had to postpone construction of new facilities, one of which is the Court Building in which the Auditorium will be located. As a stop-gap measure, a new small but extremely functional auditorium and teaching set-up has been installed on the fifth floor of The Presbyterian Hospital. This has contributed immeasurably to the effectiveness of our teaching, not only to residents but to undergraduate students as well. We are extremely grateful for this facility.

An orthopaedic pathology course for second year residents is conducted by Dr. Johnston once a week during nine months of the year. This course is to be expanded next year to include extramural residents.

Orthopaedic Research Laboratories

Under the direction and supervision of Dr. C. Andrew L. Bassett and Dr. Irwin Clark, our laboratories have continued as a focus in training in research and basic science.

Training

Currently, five trainees are engaged actively in research programs. Mr. Robert S. Middleton, a member of the present fourth year class, spent two months of his senior elective period in the laboratory during the summer and is continuing work at times consistent with his schedule. He has studied with Dr. Bassett, the histologic sequence of events following an epiphysiodesis of the Pemister type and has developed special knowledge of growth mechanisms in long bones. Much of this experience is being applied in a continuing study of the effects of electric current and electrostatic fields on epiphyseal growth. Dr. Charles Bruce Brown graduated from P & S in June 1969 and has undertaken nine months of research prior to internship. He is investigating, under Dr. Bassett's supervision, the effects of electrical and mechanical stimulation of bone formation in tissue culture as part of a continuing experiment

in this area. Dr. Robert L. S. Boothe currently is completing a year under the United States Public Health Service training grant between the first and second years of orthopaedic residency. His efforts, under Dr. Clark's supervision, have been to develop more effective and sensitive methods for isolating and assaying lysosomal enzyme fractions from bone. Following completion of his orthopaedic residency, Dr. David S. Bradford also started a traineeship and, under Dr. Clark's supervision, he has adapted methods for following the methylation of nucleic acids in bone. This potentially powerful tool is being used now to characterize several pathologic lesions of the skeleton, such as Paget's Disease. Dr. Paul L. Odebrecht joined the laboratories in April 1969, also as a trainee, following his orthopaedic residency at the New Jersey Orthopaedic Hospital.

Laboratory and Clinical Research Activities

The program of leg lengthening has continued during 1968-69, and we have now completed 18 tibial and 2 femoral lengthenings. Unlike most of the programs in this country, we have dealt with a disproportionately large number of post pubertal cases in the series. Thus far, the number of complications and healing problems have been no greater in the group above 16 years than the group below. It must be noted, however, that the rate of osteogenesis is slower in the older group and convalescence somewhat longer. It is evident from the studies that this technique should be confined to large centers where individuals with special interest and knowledge are available for case supervision.

During the past two years, a considerable amount of experience has been gained with a new compound which can control mineralization processes *in vitro* and in patients. The agent, known as ethanehydroxy diphosphonate (E.H.D.P.) is produced by Procter & Gamble. It was first used to treat a rapidly advancing case of myositis ossificans progressiva in a two year old child with moderate success. Subsequently, others with the progressive form of this condition have been treated with E.H.D.P. with similar results. Currently, the drug is being evaluated for its ability to prevent or modify certain types of osteoporosis.

The main research program in the laboratories under Dr. Bassett's supervision continues to center on bioelectric-biomechanical phenomena in bone and other connective tissues.

a. *In vitro* studies (with Dr. Brown). Although it is well established that bone and other connective tissues respond electrically when deformed, few direct links between the electric re-

sponse and cell behavior have been identified. Two main approaches have been made; one is electric stimulation of cultures and the other, mechanical stimulation of cultures.

The second phase of tissue culture work involves the cyclic mechanical deformation of limb rudiments growing in organ culture.

b. *In vitro* studies of single osteons (with Mr. Pawluk and Dr. Odebrecht) Mr. Roger Lenke, while a second year student, demonstrated that it was possible to detect electric responses from portions of the single osteon, on deformation. In order to quantitate this response and to identify more accurately the electromechanical behavior of such preparations an elaborate, sensitive apparatus, to hold and deform specimens has been designed and built. In addition to providing stress/strain relationship in discreet, largely homogenous samples, it is possible to study more intensively the origin or the electric response and quantify it at the cellular level. As an unexpected bonus, the hydrophilic nature of bone had been documented in several ways.

c. *In vitro* studies of cartilage (with Mr. Pawluk and Dr. Odebrecht). Last year cartilage (articular, meniscal, tracheal and epiphyseal) were found to produce an electric response on deformation. During the year, reports from London indicated that streaming potentials (as the result of fluid movement) were present in deformed cartilage. It therefore became important to demonstrate whether the electric response we had detected was caused by charge separation of the piezoelectric type or by streaming potentials or by both. Recent studies indicate that both types are present in cartilage. Insofar as the effect on cell behavior is concerned, however, the total potential difference probably is the most important consideration, regardless of its origin. The more accurate characterization of the electric behavior of cartilage has prompted changes in the design of electric devices destined to alter growth rates in the epiphyses.

d. *In vivo* studies of electric effects on osteogenesis (with Mr. Pawluk). Direct current flowing in the medullary canal of bone increases osteoblastic activity around the negative electrode. The new bone stimulated electrically, however, is difficult to differentiate from that arising solely from the process of electrode insertion. Furthermore, new bone around a negative electrode within the medullary canal serves little or no physiologic function. In order to clarify the role of electrical stimulation, a new model for studying osteogenesis has been developed. This model consists of a circular defect in

canine cortical bone incorporating a teflon ring and has the following characteristics: 1) substantially diminished rate of osseous bridging, 2) a volume appreciably greater than the combined volume of the inserted electrode and the reactive bone encapsulating the electrode. Four weeks after surgery a defect lined with a teflon ring contains only soft tissue whereas an unlined defect is completely bridged by fiber bone. During the next six weeks, fibrous tissue within the ring gradually is replaced by primary bone arising appositionally from reactive endosteal bone. Insertion of a negative electrode into a teflon lined defect increases significantly the amount and rate of osteogenesis above that resulting from a neutral electrode. The experiment also suggests that bone resorption can occur at the positive electrode and that orientation of bone in the medullary canal may be field dependent. This model not only provides a "controlled defect" to study the amount, orientation, and rate of electrically stimulated bone formation, but affords features which could be valuable in biomechanical and toxicologic studies.

e. *In vivo* and *in vitro* studies of the bioelectric phenomena in teeth and their supporting structures (with Dr. Albert Zengo and Mr. Pawluk). The National Institute recently has awarded a 3 year grant to support a collaborative effort in the laboratory with the Dental School. Specifically, the project seeks to correlate electromechanical behavior in the periodontal membrane and surrounding bone with cellular responses observed during orthodontically induced tooth movement. Furthermore, the effects of artificially induced electric currents and electrostatic fields on the supporting structures of the tooth are being studied. This program fits well with the total orientation of the research effort and provides a unique model system for investigating osteoblastic and osteoclastic function in response to electromechanical stimuli.

During the past year, Dr. Clark has continued his investigations concerning interrelations between calcium, magnesium and phosphate on skeletal metabolism. Further he has been studying the interactions of these ions with adrenal and parathyroid function.

Members of the staff, attendings and residents, presented a number of papers at meetings outside the Center, and continued various research projects and studies.

Dr. Ambrose is continuing his studies on slipped upper femoral epiphyses and on wound healing. Dr. David I. Andrews conducted the fourth annual course on emergency care and transportation of the

sick and injured. There were 250 registrants for this course, sponsored by the American Academy of Orthopaedic Surgeons, here at the Medical Center. Dr. Robert E. Carroll has continued his keen interest in orthopaedic hand surgery, his procedures and techniques being an attraction for numerous observers from the United States and many foreign countries. Dr. Harold M. Dick maintains his interest in both hand surgery and bone tumors. Radiologic clinical and histologic characteristics of chondromyxoid fibroma of bone have been reviewed by Dr. Johnston in collaboration with Dr. Frieda Feldman (Radiology). This work has been accepted for publication by *Radiology*. Dr. Keim is conducting research on angiographic studies of blood supply to the spinal cord and pulmonary function in scoliosis patients. Dr. Neer is continuing a number of projects with various members of the staff.

Our resident staff has remained active in various research projects, work being carried on by Drs. W. Dilworth Cannon, Jr., Robert R. Foster, David P. Green, Price Gripekoven, William R. Kennedy, Joseph P. Leddy, Thomas J. Neviaser, Caldwell H. Oliver, Jr., John W. Packer, Joel E. Rothermel, David M. Smith and Joel D. Weinstein.

We are deeply appreciative of the continued support of The New York Orthopaedic Hospital by its Women's Auxiliary.

The New York Orthopaedic Hospital is extremely grateful to its many friends who so generously helped to carry on our work in 1969. These contributors include Mr. Malcolm P. Aldrich, Mrs. Edward J. Birmingham, Mr. Paul G. Bigler, Mrs. Carolyn V. Bourne, Dr. Robert E. Carroll, Mr. Frank W. Clark, Jr., Dr. Basil J. Elmers, Mr. Gustavus J. Esselen, III, Mrs. Lillian Fangmann, Mrs. Anna I. Feldman, Mr. Harvey S. Firestone, Jr., Mr. Sheppard Franklin, Dr. Nicholas Giannestras, Mr. L. Martin Harris, Mr. and Mrs. H. H. Hoyt, Jr., Miss Marion C. Kenton, Dr. Leonard Marmar, Mr. and Mrs. L. F. McCollum, Mr. George Miller, Mr. Charles S. Munson, Mr. Walter H. Simson, Mrs. Bernard E. Smith, Mr. Bernard E. Smith, Jr., Mrs. Frank E. Stinchfield, Mrs. DeWitt Wallace, Dr. and Mrs. Alfred E. Wallis, Mr. and Mrs. Harold P. Wilmerding, the Atomic Energy Commission, the Health Research Council of the City of New York, Merck and Company, the National Institutes of Health, the Orthopaedic Research and Education Foundation, the Proctor and Gamble Company, the Squibb Institute for Medical Research, the Williams-Adler Foundation, and the Women's Auxiliary of The New York Orthopaedic Hospital.

During the past year we record with deep sorrow

the death of Madeline C. Hibbs, widow of the late Dr. Russell A. Hibbs who outstandingly served as Director of The New York Orthopaedic Hospital from December 1899 until his death in May 1932.

Mrs. Hibbs bequeathed a generous contribution to the Russell A. Hibbs Library, which was established in memory of Dr. Hibbs.

1969 Publications

Orthopaedic Surgery

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Otolaryngology

DANIEL C. BAKER, JR.

Professor and Chairman of the Department · Director of Service

The clinical activities and research programs have continued as in the past. The much needed laboratory space, which had been promised to the department for several years, has again been denied. This has seriously hampered the present and future development of our research activities. It is to be hoped that the coming year will solve this pressing problem.

Dr. Elliott C. Greenfield, Assistant Professor of Otolaryngology, who had been assigned to neuro-otology and research on the inner ear, resigned to go into private practice. Dr. Carol H. Ehrlich, Assistant Professor of Otolaryngology, in charge of Audiology and Speech, resigned to return with her family to Denver, Colorado.

Dr. Milan Kovar joined the staff as Assistant Professor of Otolaryngology. He will engage in teaching and research on the histopathology of the temporal bone. Dr. Kovar completed a year of fellowship under a National Institute of Health grant at the Armed Forces Institute of Pathology. Dr. Robert Eberle was appointed Assistant Clinical Professor of Otolaryngology and Assistant Attending Otolaryngologist in Presbyterian Hospital. Dr. John Palesty was appointed an Assistant in Otolaryngology and assigned to Vanderbilt Clinic. Dr. Howard Zipper joined the staff in Vanderbilt Clinic as Assistant Otolaryngologist. Dr. Robert M. Hui was promoted to Professor of Clinical Otolaryngology and Attending Otolaryngologist in Presbyterian Hospital. Dr. Robin M. Rankow was promoted to As-

sociate Professor of Clinical Otolaryngology and Associate Otolaryngologist.

There has been a great change in the teaching of otolaryngology to the undergraduate medical students. This year each section of third year medical students are assigned five mornings making a total of fifteen hours. Considerable thought has been given to the presentation of the specialty. It has been possible to present the subject in a manner that has engaged the interest of the undergraduates beyond our expectation. Although it is too soon to tell the results of the curriculum change, many of the students have shown interest to the point of returning to do further work in our clinic on their own time. Elective courses are being planned in the department for the third and fourth year students.

The construction of the emergency service in Vanderbilt Clinic will affect the ear, nose and throat out-patient service and the Audiology and Speech Clinic more than any other service. It will be necessary to move to another area in Vanderbilt Clinic.

The neuro-otology unit on the 13th floor of the Neurological Institute has been completed. Dr. Malcolm Schvey is in charge of this unit. Neurological studies including electronystagmography, audiometry and facial nerve testing will be carried out in this area. Ear, nose and throat consultations will also be taken care of in this unit. Efforts are being made to secure a full time staff member to develop the program in neuro-otology.

The basic science courses given to residents in oto-

laryngology at Presbyterian Hospital and affiliated institutions of the College of Physicians and Surgeons have continued to enjoy popularity. A working arrangement has been maintained with the Department of Otolaryngology at the Mt. Sinai School of Medicine. Residents from each institution are able to take the special courses in ear, nose and throat disorders given in each medical school.

Dr. Daniel C. Baker, Jr. continues as a member of the Committee on Graduate Education of the American College of Surgeons. He is also a member of the Communication Disorders Research Training Committee of the National Institute of Neurological Diseases and Stroke. He is also a Director of the American Board of Otolaryngology. Dr. Baker gave the Leroy Schall Lecture before the New England Otolaryngological Society.

Dr. John Conley was elected a member of the Council of the American Society of Head and Neck Surgery. He also served as a Visiting Professor of Otolaryngology at the Fitzsimmons General Hospital, Department of the Army. He gave a post-graduate course in diseases and surgery of the head and neck at the University of Kingston, Jamaica. He delivered a paper on surgical treatment of the facial nerve in parotid surgery at the IX International World Congress of Otolaryngology in Mexico City. He also presented a paper on minor salivary gland tumors at the Pan Pacific Surgical Association in Honolulu.

Dr. Juergen Tonndorf was made a corresponding member of the German Society of Otolaryngologists. He has continued his research in the mechanics of the ear. He has developed a new concept of the middle ear transformer mechanism following a study of the vibratory pattern of the tympanic membrane.

Mr. Shyam Khanna has been engaged in research work with Dr. Tonndorf. Mr. Khanna will complete the requirements for his Doctor of Philosophy degree this coming year.

Dr. Jules G. Waltner in cooperation with Dr. Milan Kovar has continued his research work on the pathology of the temporal bone. Dr. Kovar is engaged in the study of temporal bone pathology. He has also been conducting the courses for residents in the field of histopathology of the ear, nose and throat.

Dr. Milos Basek is engaged in research involving the use of ultrasound through the round window

for the treatment of Meniere's disease. In conjunction with Mr. Khanna a new generator for the testing of bone conduction in profound hearing loss has been completed.

Dr. Robert M. Hui has been engaged in the study of hearing problems in congenital abnormalities in infants. He is also evaluating the approaches to the pituitary gland and various modalities of therapy. In this field he has been working with Dr. Edgar Housepian (Neurological Surgery) and Dr. Donald Holub (Medicine). He has been an active participant in the revision of the standards for hearing and speech centers in New York City.

Dr. Malcolm Schvey has continued his activities with the Haskins Laboratory. This institution is engaged in basic research of speech and voice production. He has been appointed a consultant in otolaryngology at the Haskins Laboratory. In conjunction with Dr. Baker he has revised the chapters on ear, nose and throat diseases in the new edition of *The Merck Manual*. Dr. Schvey is also serving as the head of the neuro-otology unit in the Neurological Institute.

Dr. Alvin Glasgold has been appointed head of the Department of Otolaryngology at the Middlesex Hospital in New Brunswick, New Jersey. He has also been appointed Director of the Speech and Hearing Clinic at the Middlesex Rehabilitation Hospital.

Dr. Barry Kronman joined the residency staff on July 1, 1969. He had been an Associate at the National Cancer Institute. In addition to his duties as a resident, he has been given laboratory space in the Francis Delafield Hospital and will engage in research on cellular immune reaction in vivo and in vitro to tumor and tumor-specific antigens, under the supervision of Dr. Elliott Osserman.

Distinguished visitors to our department during the year include Professor Rudolf Stellmach of Berlin, Professor Erwin Haas and Professor K. Fleischner of Germany, Professor Hitosi Iawai of Kyoto and Professor Yoshitaka Kawabe of Nagoya, Japan, Professor Karl Fritz of Vienna and Dr. Jose Carlos Rosa of Sao Paulo, Brazil.

Major contributors to the Department of Otolaryngology have been Mr. Walter Simson, The Allen Foundation, United States Aviation Underwriters Corporation, Mr. and Mrs. Daniel H. Silberberg, and the National Institutes of Health.

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Pathology

DONALD W. KING

Delafield Professor and Chairman of the Department • Director of Service

The department continued to expand its research, education and service program. Dr. Raymond Gambino was appointed Professor of Pathology and Director of the Clinical Chemistry Laboratories. Planning for centralization of the clinical laboratories in the Medical Center was initiated including modernizing the data collection and distribution system for prompt accurate reports. An automated blood-gas analyzing instrument was placed in the recovery room in order to bring critical measurements of Po_2 , Pco_2 and pH directly to the bedside of our sickest patients.

The Harlem Hospital Division acquired new quarters and has integrated the central laboratories to provide modern laboratory service for increased patient care. A new Toxicology Laboratory for the extraction of narcotics and other urinary alkaloids has been operative for six months. A Training School for Laboratory Technicians (a department sponsored program for community youth), was initiated at Harlem Hospital.

Teaching

The Medical and Dental Schools pathology curriculum was markedly shortened. The course continued to be taught in three sections: i.e. survey — pathobiology — systemic pathology. Over one hundred electives in the second, third and fourth years, externships in the surrounding hospitals and immediate answer examinations were introduced. Modifications were also made in the teaching of neuropathology. These included lectures to small groups

of students in the laboratory, and an informal weekly clinicopathologic conference in the second and third year.

The final examination on February 26th was attended by 300 students staff and visiting external examiners. These included: Professor Archibald Morrison (Rutgers University), Patrick Fitzgerald (Downstate Medical Center), Hans Popper (Mount Sinai Medical School), Peter Nowell (University of Pennsylvania), G. Aponte (Jefferson Medical College), John Kidd (Cornell) and Levan Waters (Yale).

The residency program was further defined with a two year core curriculum followed by a two year specialization period in one of the ten divisions of the department. In addition, postgraduate courses in urology and orthopedic pathology were offered and several fellows from outside hospitals rotated through several of the divisions.

The graduate training program, under the direction of Dr. Henry Vogel was expanded to include ten Ph.D. candidates. A successful open house luncheon was held for the purpose of recruiting candidates for this program on November 1st.

A pathobiology conference was held in Aspen from August 4 through 13, in which a broad spectrum of modern biology was presented to over two hundred participants. Among the twenty members of the faculty, two members from Columbia were included: Drs. Elvin Kabat (Microbiology) and Sol Spiegelman (Institute of Cancer Research).

The annual meeting of the department was held

at Arden House on October 3-5. Guest speakers included Charles Alford (University of Alabama), George Margolis (Dartmouth), Neil Nathanson (John Hopkins), Michael Oldstone (Scripps Clinic), Donald Summers (Albert Einstein), Igor Tamm (Rockefeller). The topic was advances in viral disease.

Research

Dr. Gabriel Godman, together with Mr. Stanley Sawicki, is studying the nature of the cytotoxic and cytocidal effects of moderate doses of Actinomycin D on susceptible cell types in cell culture, and the reasons for cellular resistance to this agent. The disproportionate development of mitochondria during the unbalanced growth of cultured cells following treatment with Actinomycin has been the object of investigations pursued in collaboration with Dr. Mary King.

Drs. Godman and Arlene Deitch studied the mechanisms of the cytopathic effect of enterovirus infection. The nature and cause of the suppression of host-cell RNA synthesis occurring during infection was investigated by examining the synthesis and types of histones present in the nuclei of infected cells, using acrylamide gel electrophoresis.

Dr. Hans Kaunitz is studying the effect (in rats) of nine common dietary fats prepared fresh, after mild oxidation or, after irradiation. Rats fed chicken or soy bean oil, had the largest tumor incidence. There does not appear to be any correlation between saturation or unsaturation of fats.

Dr. Henry Vogel, in collaboration with Dr. Thomas Leisinger, has studied arginyl-tRNA profiles as a function of repression-derepression.

Drs. Henry Vogel and Ruth Vogel analyzed two different phenomena which revealed the effect of high concentrations of Mg ions on derivatives of *E. coli*, K12. Miss Elo Urm investigated a Mg-dependent lowering of the growth rate phenomenon.

Dr. William L. McLellan has carried out a series of experiments on the purification and properties of arginine biosynthetic enzymes, in connection with several chapters which were prepared for a forthcoming volume in Methods in Enzymology. Arthur P. Bollon explored the adjustable restrictive utilization of N-acetylarginine as a source of arginine by *E. coli* mutants.

The nature of the "hyaline droplets" which appear in the cytoplasm of intensely stimulated adrenal cortical cells, has been studied further by Dr. Herbert Stoerk with light and electron microscopy.

Dr. Sigmund Wilens carried out investigations correlating coronary artery size in humans at au-

topsy with weight of the heart, sex, and other cardiac lesions. Experiments evaluating the effect of vitamin D and hormones (adrenalin, ergosterol) on calcification of rabbit arteries are also in progress.

Drs. Lester Geller and David Cowen are investigating the development of treatments or procedures for ameliorating the retarding effect of prenatally-induced brain damage on learning and memory abilities. Drs. Geller, Cowen and Abner Wolf are continuing their investigation of the etiology and consequences of perinatal damage to the central nervous system, emphasizing the retarding effect of prenatally-induced brain damage in rats upon learning and memory abilities.

Drs. Geller, Cowen and Wolf have also described a simple technique utilizing multiple electroconvulsive shocks for the rapid and consistent production of closed-head, bilaterally symmetrical focal lesions in the infant rat's cerebral cortex, without the incidental damage that accompanies other experimental injuries to the central nervous system.

Drs. Cowen and Wolf, together with Drs. Joo H. Sung and Emanuel M. Stadlan (University of Minnesota), Dr. James P. Meyers (Kansas City General Hospital), completed a study of the neuro-pathological changes in Chediak-Higashi disease.

Dr. Philip Duffy, together with Drs. Jane Simon and Richard Defendini have described a new method for the recovery and processing of cells from spinal fluid which permits their study by electron microscopy. Together with Drs. Leon Kremzner (Biochemistry), Defendini, Marie J. Terrano (Neurology), Dr. Duffy is also studying the metabolism of polyamines in normal human cortex and white matter and in tumors of the central nervous system. Drs. Duffy and Markesberry, have carried out an electron microscopic study of the effects of certain pharmacologic agents (reserpine, p-chlorophenylalanine, desmethylimipramine, pargyline, and oxypertine) on granulated vesicles in the pineal gland, permitting some new conclusions to be drawn concerning the catechol and indoleamine content of the vesicles.

Dr. Virginia Tennyson is continuing her studies of the ultrastructure of the developing nervous system. Completed this year was an investigation of the fine structure of the growth cone of the dorsal root neuroblast of the rabbit embryo. Together with Dr. Miro Brzin (University of Ljubljana, Yugoslavia). Dr. Tennyson conducted ultrastructural and microgasometric studies of acetylcholinesterase (AChE) in the embryonic dorsal root neuroblast. Other ultracytochemical investigations by

Dr. Tennyson include a study of the development of AChE in the primitive motor end plate, in embryonic heart muscle with Drs. Martin Hagopian and David Spiro (New York Medical College), and in somites with Dr. P. Slotwiner (Mt. Sinai Hospital).

Dr. Herbert Barden has studied the relationship of neuromelanin to lipofuscin, concluding that the former may be melanized lipofuscin. In collaboration with Mr. Eugene Martin, electronic engineer at the Philips Electronic Corporation, Dr. Barden utilized an electron probe microanalyzer to demonstrate particularly high concentrations of sulfur in neuromelanin.

Dr. Roizin, in cooperation with Drs. Mavis Kaufman, George Alexander (Chemistry), George Gold and Claire Lawler (Psychiatry) and Miles (Neurotoxicology Research Unit), continued with the multidisciplinary investigations of side reactions and toxic effect of phenothiazines and hallucinogens in various experimental conditions as well as in some human autopsy material. In addition, Drs. Leon Roizin, Mavis Kaufman, Ralph Wharton (Psychiatry) and Housepian (Neurological Surgery) carried out correlated histopathologic, histochemical and electron microscopic investigations on a prefrontal biopsy of a case affected by familiae presenile psychosis. Dr. Roizin, in cooperation with Drs. William Caveness (Neurological Institute and National Institute of Neurological Diseases and Stroke), Arland Carsten (Brookhaven National Laboratory) and John Schade (Central Institute of Brain Research, Amsterdam, The Netherlands) completed a long-term multidisciplinary and ultracellular investigation on the pathogenesis of x-irradiation effects in the monkey's cerebral cortex. The effects of phenothiazines and hallucinogens (LSD-25 and Mescaline sulfate) upon the ultra-cellular organelles of the CNS (Golgi complex and synapses) are pursued by Dr. Roizin in various experimental conditions.

Drs. Gordon Kaye, Nathan Lane and Robert Pascal continue their collaborative investigations of epithelio-mesenchymal interactions in the replication of normal and neoplastic colonic epithelia. In collaboration with Dr. Frank Hoeffle (Corneal Center), Dr. Kaye and Mrs. Jeanne Cole are continuing studies of the morphophysiology of the rabbit corneal endothelium.

Dr. Richard N. Snyder, NCI trainee, completed a study on the maturation of metastases from teratocarcinoma of the testis; he has also completed a clinical pathologic analysis of a series of cases of papillomatosis of the nasal and paranasal cavities,

in collaboration with Dr. Karl Perzin. Dr. Joseph Tomasulo with Dr. Raffaele Lattes is completing a clinical pathological analysis of a large series of gastric polyps and of their possible role as precursors of gastric cancer. Dr. Perzin has completed his clinical pathologic study on mucoepidermoid carcinoma in collaboration with Dr. William Healy (Surgery). In addition, Dr. Perzin has initiated other studies on nipple papillomatosis; squamous metaplasia of nipple ducts as a cause of chronic subareolar abscess; and papillomatosis of the nasal cavity.

In collaboration with Dr. Robert DeRossi, Dr. Lattes is attempting to reach a better understanding of the natural history of a group of soft tissue tumors of histiocytic origin in the hope of establishing reliable prognostic criteria based on histological features.

Dr. Austin Johnston in collaboration with Dr. Frieda Feldman (Radiology) has reviewed radiologic, clinical and histologic characteristics of chondromyxoid fibroma of bone. Material continues to be collected for electron microscopy with surgical pathology.

Dr. Myron Tannenbaum has conducted electron microscopy studies on the invasion process of cancer of the bladder.

Dr. Ralph Richart has presented a theory of cervical carcinogenesis which correlates with his experimental work. He postulates that the occurrence of neoplastic cells in a sheltered site at the squamo-columnar junction of the cervix is protected by an epidermal chalone, a mitotic inhibitory factor. In collaboration with Mr. Stanley Goldfarb, a medical student from the University of Rochester, Drs. Richart and Okagaki have studied the nuclear DNA content of a rare gynecological condition, endolymphatic stromal myosis. In another collaborative study, Drs. Arthur Ludwig (resident) and Richart reviewed the literature regarding alterations of chromosomes and nuclear DNA content in gynecological neoplasms.

Dr. Blanc continued his research on immunoglobulin production in the fetus and newborn; electron microscopy of fibroblasts of metabolic disorders, morphometrics of growth retardation in experimental animal and human subjects. Together with Dr. Richard Naeye (Hershey Medical Center), and Dr. Wigger, he continues his investigations on the ultrastructure of children's tumors.

Dr. Bernard Wagner, with Dr. Ralph Strelbel (New York Medical College), continued his investigations concerning mechanisms of connective tissue calcification.

Drs. Wagner and S. C. Mohos (New York Medical College) studied the release of a variety of hydrolytic enzymes by polymorphonuclear leukocytes in the area of immune precipitate in the rabbit cornea. With Dr. Shirley Siew (New York Medical College), Dr. Wagner has completed a study on the ultrastructure aspects of the Anitschkow cell. With Dr. Robert Leader (Rockefeller), Dr. Wagner continued his studies on the Aleutian disease of the mink. These studies are concerned with the relationship of Aleutian mink disease to human connective tissue disorders.

In collaboration with Dr. Edward Moscovic, Dr. Henry Azar has studied the fine structure of peculiar pigment granules in the reticulo-endothelial cells of sarcoid lymph nodes. Drs. Roberts, Azar, Moscovic, Felton and Wu are studying sarcoidosis in the Harlem community.

Further electron microscopic studies by Dr. Azar of human syphilitic chancres revealed that the *Treponema Pallidum* organisms were principally located in intercellular spaces in the direct vicinity of small blood vessels. Investigations are currently in process on the fine structure of plasma cells, as well as plasmacytoma cells in Balb/c mice, eight months after the induction of plasma cell granulomas and transplantable plasma-cytomas by means of intraperitoneal injection of "Prestane" (2, 6, 10, 14-tetramethylpentadecane). In collaboration with Dr. Lewis Shapiro (Dermatology) nine patients with lichen amyloidosis (a type of localized cutaneous amyloidosis) were studied by a variety of histochemical techniques and electron microscopy.

Investigations are being carried out at Harlem Hospital by Drs. Moschides, Roberts, Swartz and Felton on the clotting factors and endometrial histologic pattern in patients on contraceptive drugs.

Dr. Jacob Furth investigated type responsiveness of mammary tumors to hormonal stimulation of their nucleic acid synthesis. Drs. Furth and Ito, together with Peggy Moy are working on the effect of isologous prolactin and growth hormone on RNA synthesis *in vivo* in these tumors.

Dr. Elliott Osserman with Drs. Barbara Bick, Mehdi Farhangi and James Halper, (P&S '71) continued a long-term clinical investigation of patients with multiple myeloma, macroglobulinemia and related plasma cell dyscrasias.

Dr. Donald King completed studies on the effect of labeling of nucleoli during the G-1 stage of the cell cycle and studies on the effect of anaerobiosis on the morphology and biochemistry of mitochondria. He is studying with Dr. Mary E. King the effect of actinomycin D on cytochrome c synthesis.

Honors

Dr. William A. Blanc has been appointed as a consultant to the Perinatal Research Branch, National Institute of Neurological Disease and Stroke.

Dr. Abner Wolf has been appointed a Vice-President of the 1970 International Congress of Neuropathology and a member of the Executive Committee of the International Society of Neuropathologists.

Dr. Philip Duffy, received the Joseph Mather Smith Prize for 1969.

Dr. Leon Roizin was awarded the Distinguished Service Citation by the New York State Department of Mental Hygiene.

Dr. Bernard Wagner has been appointed to the editorial board of the journal, *Human Pathology*, published by the W. B. Saunders Company.

Dr. Lattes was elected President of the New York Pathological Society for the academic year 1969.

Dr. Osserman was made a Life Professor of the American Cancer Society, elected secretary of the Harvey Society and was appointed Associate Director of the Institute for Cancer Research.

Dr. J. Furth retired as Director of the Institute for Cancer Research.

Staff Changes

The following were appointed professors: Drs. S. Raymond Gambino and Gabriel Godman.

Promotions

Dr. Mavis Kaufman was promoted to Associate Professor; Dr. John Gorman to Associate Clinical Professor; Dr. Joseph T. Tomasulo to Instructor and Dr. Hans Kaunitz to Clinical Professor. Dr. Angeline Mastri resigned as Assistant Professor.

Acknowledgments

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Pathology

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Pediatrics

EDWARD C. CURNEN, JR.

Carpentier Professor and Chairman of the Department • Director of Service

Further progress in the development program for Babies Hospital has been made by the construction of ten more floors on the new addition and enclosure of the twelfth floor of the old building. Two floors of the new addition will be occupied by general service laboratories for the Medical Center. The other floors will remain unfinished until funds are provided to make them available for services to children. The twelfth floor of the old building will be completed in 1970 to accommodate a new special care nursery for newborn infants. Funds for this unit have been provided by a generous gift of the Mary Flagler Cary Trust. Moving the infant special care nursery to this floor is the first step in a long range plan which envisions the eventual relocation of obstetrical services to the adjoining twelfth floor of Presbyterian Hospital. This would then provide on one floor in both buildings an effective consolidation of perinatal activities devoted to the optimal care and welfare of both mother and infant.

We report with regret the death of Dr. Sue Buckingham, Assistant Professor of Pediatrics and Assistant Attending Pediatrician, on January 22, 1969 at the age of forty-five. She was a faithful member of the staff since 1963.

Changes in Staff

New appointments in 1969 included Dr. Gabriel V. Duc, Assistant Professor of Pediatrics; Dr. Carl S. Strande, Associate; Dr. John W. Balfe, Associate; and Drs. John M. Driscoll, Jr., Pureza Flor

U. Gaerlan and Carl N. Steeg, Instructors. The part-time staff in the pediatric clinic was augmented during the year by the appointments of Drs. Robert F. Biehl, Matilda B. Brust, Lydia Eviatar, and Victor Shulman as Instructors; Drs. Alma T. Blitz, Judith E. Frank, I. Bruce Gordon, and Betty Chi Mei Lee Kuo as Assistants. The Hospital and Vanderbilt Clinic staff were augmented by the appointments of Dr. Erich J. Kahn, Director of Pediatric Service at Harlem Hospital, as Attending Pediatrician; Dr. David Rush as Assistant Attending Pediatrician; Dr. Martin B. Vita, as Assistant Pediatrician; Dr. Wiener Leblanc and Dr. Michael L. Lapkin were appointed Assistant Pediatricians in Vanderbilt Clinic. Dr. John A. Stephenson was appointed as an Instructor at the Mary Imogene Bassett Hospital in Cooperstown, New York.

Resignations from the full-time staff included Dr. Poul A. Kildeberg and Dr. Knud Engel, Assistant Professors; Dr. John W. Balfe, Associate; and Dr. Susan T. Fisher, Instructor.

Promotions as of July 1, 1969, included the following: Dr. Katherine Sprunt to Associate Professor and Associate Attending Pediatrician; Drs. Jennifer J. Bell and Eugene L. Klenk to Assistant Professor; Dr. Joseph A. Silverman to Assistant Clinical Professor; Drs. Robert E. Appleby, Robert H. Bierman, and Martin B. Vita to Associate part-time and Drs. Yvonne T. Driscoll, Margaret Rice, and Robert M. Schwartz to Instructor part-time.

Staff Honors and Activities

Dr. Edward C. Curnen, Jr., served as vice-president of the American Pediatric Society and as a member of the executive committee of the Health Research Council of the City of New York.

Dr. Carolyn Denning was elected a member of the Society for Pediatric Research and of the Harvey Society.

Dr. John C. Sinclair was a Visiting Lecturer at the University of Minnesota. Dr. Robert W. Winters spent the year on sabbatical leave as a Commonwealth Fund Fellow. During this period he undertook a study of computer assisted medical instruction in collaboration with the RAND Corporation. Dr. Stuart Stevenson was appointed to the editorial board of the New York Academy of Medicine. Dr. Sidney Blumenthal was elected president of the Sub-Board of Pediatric Cardiology of the American Board of Pediatrics and continued as chairman of the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association. Drs. O. Robert Levine and Robert B. Mellins were elected to membership in the American Physiological Society. Dr. Irene Stachura was elected to membership in the Electron Microscopy Society of America.

Teaching

The Department of Pediatrics has been active in the planning of a new curriculum for the medical school and in the development of its own teaching program for students. Further participation in the course on the introduction to the patient given in the second year is planned in anticipation of the clinical clerkship given in the third year. Various elective courses for fourth year students were introduced and the list will be expanded next year when all fourth year assignments will become elective.

With continued financial support from the Division of Regional Medical Programs, United States Public Health Service, the staff of the pediatric pulmonary disease center under the direction of Dr. Carolyn Denning has been further enlarged to include Dr. Anbukili Chetty as a clinical fellow, Dr. Gacran, Dr. Leah Beck as part-time pediatric psychiatrist, and a nurse-instructor, physical therapist and social worker, all full-time. This has broadened the scope of patient care and greatly enhanced our teaching program. Two five-day courses for paramedical personnel were held in 1969 with a combined registration of over 150 persons from all over the United States.

The internship in pediatrics introduced in 1968 has been highly successful. This year the number

of interns enrolled through the National Matching Plan was increased from eight in the previous year to ten without increasing the total number of house staff positions.

Patient Care

With guidance by Dr. William A. Bauman, the first automated hospital information system in the Medical Center is being installed in Babies Hospital. The system accepts and distributes admitting, transfer and discharge data for each in-patient. A similar laboratory reporting system has undergone preliminary trial and is being converted by Dr. Ralph Dell to run on the same computer. Laboratory results will then be transmitted directly to the service areas thereby providing more rapid and more accurate reports. A pilot decision support system is undergoing tests in the well baby clinic and the distributing clinics, and a prototype advanced reservation (forecasting) system has been developed by Dr. Charles Ryder for the pediatric orthopedic patients.

Under the supervision of Drs. Gilbert Mellin and Katherine Sprunt, information generated in the Babies Hospital bacteriology laboratory is being key punched on a daily basis. A system for recording the reports of the Babies Hospital pathology laboratory is also being developed with the help of Drs. William Blanc and Joachim Wigger (Pathology).

The medical intensive care unit on the eighth floor of Babies Hospital continues to provide constant supervision and sophisticated medical care to infants and children during the acute phase of illness. The unit, which is under the direction of Dr. Mary Jane Jesse, has cared for 150 acutely ill patients. Cardiac catheterization and angiography was performed in the cardiovascular laboratory on 194 patients. Of these, 52 were less than one year old.

The pediatric kidney clinic, under the direction of Dr. Klenk and assisted by Drs. Vita, John W. Balfc and James Chan recorded 502 out-patient visits.

Two hundred and fifty-three patients with cystic fibrosis, 82 patients with some form of malabsorption, and 25 patients with other pulmonary problems are being followed regularly.

The following statistics were compiled by the pediatric cerebral palsy clinic: physical therapy visits 1,278; occupational therapy visits 380; speech therapy visits 230; medical visits 1,021; dentistry 313; social service 528, and psychological evaluations 127.

During 1969, there were a total of 30,635 visits to the pediatric clinics. Of these, 4,009 were to the general clinic, 26,626 to the specialty clinics. New

patients totalled 6,519. There were 4,542 admissions to Babies Hospital during the year.

The Child Health Station of Central Harlem was transferred to the pediatric department of Harlem Hospital Center in January 1969. The services provided to children attending this clinic are being expanded into a comprehensive care program. Visits in this clinic are running at an annual rate of 6,000 and are expected to reach 10,000 within eighteen months. Dr. Klenk is director of the newly organized pediatric renal clinic and consultant in pediatric kidney diseases at Harlem Hospital. Out-patient consultation service for pediatric endocrinology at Harlem Hospital Center was provided by Drs. Morishima and Bell.

Research

Dr. Akira Morishima has continued long-term studies on the sex chromosomes. Drs. Morishima and Joan H. Mathews are investigating the temporal relationship between the clinical manifestations of sexual development during puberty and the increase in circulating FSH, LH, estrogens and testosterone in collaboration with Drs. Raymond L. Vande Wiele (Obstetrics and Gynecology), Michael Cohen and Iris Litt (Montefiore Hospital). Drs. Morishima, Mathews and Cyril A. L. Abrams studied the effect of 6-medroxyprogesterone acetate on the function of hypothalamic-pituitary-adrenal gland axis in patients with sexual precocity. Drs. Jennifer J. Bell, Morishima and Abrams, with Dr. Andrew G. Frantz (Medicine), are continuing their studies on the effect of human growth hormone administered to patients with hypopituitarism. Dr. Bell has continued work on the human placental chorionic gonadotropin (HCG) with Dr. Robert E. Canfield (Medicine). Dr. Bell has developed a method of radioimmunoassay for quantitation of the minute amounts of HCG and is modifying this method for assays of HCG and LH in biological fluids. She is also continuing her investigation on structural and immunological similarities and dissimilarities of HCG excreted by patients with trophoblastic diseases as compared with those excreted by normal pregnant women. Dr. Abrams continues to investigate the effect of human growth hormone on *in vitro* multiplication of peripheral lymphocytes. He has also studied the karyotypes of patients with multiple congenital anomalies.

Dr. Sidney Blumenthal is the principal investigator and Dr. Mary Jane Jesse a collaborator in an ongoing National Cooperative Study of the Natural History of Congenital Cardiac Anomalies. Dr. O. Robert Levine has continued his studies of pulmo-

nary physiology in the dog using the multiple indicator and dilution techniques. In collaboration with Dr. Robert B. Mellins he has investigated the influence of gravity on the distribution of pulmonary blood flow. Other studies in progress are directed toward the mechanisms of selective permeability of the pulmonary capillary. Dr. Mellins has completed studies on the site of airway obstruction in cystic fibrosis and on the relative importance of the systemic and pulmonary circulations on the formation of pleural and pericardial fluid. In collaboration with Drs. Levine and Curnen, he has developed a model of overwhelming infection in the primate. Studies of the changes in the cardiovascular system and in coagulation in this model are now in progress. Dr. Welton M. Gersony has completed studies on changes in lactic dehydrogenase and isoenzymes in myocardial disease of children. He is currently engaged in studies on venoarterial shunts in the respiratory distress syndrome in collaboration with Drs. Gabriel V. Duc, John C. Sinclair and Ralph B. Dell. Dr. Sylvia P. Griffiths is continuing a study of infants with large ventricular septal defects who developed congestive heart failure, with particular reference to growth parameters and response to surgical management. Dr. Carl Steeg, with Drs. Henry Gelband and Joseph Bordiuk, has completed a study of electrocardiographic changes seen in children undergoing pneumoencephalography. Dr. Steeg in collaboration with Dr. Blumenthal is studying the incidence of infective endocarditis in congenital heart disease. Dr. Steeg is also pursuing studies on the distribution of pulmonary blood flow in patients with right to left shunts using scintillation scanning techniques. Dr. Gelband, in collaboration with Drs. Robert Myerburg, Albert Waldo, Brian Hoffman (Pharmacology) and Drs. James Malm, Frederick Bowman, Gerald Kaiser (Cardiovascular Surgery), is investigating the electrophysiological properties of the heart in animals and in human atrial tissue obtained during open heart surgery. Dr. Gelband is also studying post-operative arrhythmias by means of atrial electrodes implanted at the time of open heart surgery.

The participation of this department in the studies of Children's Cancer Study Group A has continued. These have included investigations related to the chemotherapy of childhood leukemia and expanded interest in the natural history and treatment of solid tumors of childhood. Dr. James A. Wolff is the principal investigator with the support of Dr. Anneliese L. Sitarz as associate investigator. Dr. Wolff, as a member of the recently formed National Wilms Tumor Study Committee, has been instrumental in

designing the chemotherapeutic approach which will be utilized in a nationwide protocol for the management of Wilms' tumor. An extensive program to investigate the value of hypertransfusion combined with iron removal by chelation in thalassemia has been started by Dr. Wolff with the help of Drs. Sitarz, Stephen Glaser and Harry R. Lubell. Comprehensive long-term studies related to iron overload and tissue hypoxia as factors leading to morbidity and mortality in this chronic anemia have been initiated. The Pediatric Hematology Clinic has also continued its collaboration with Dr. Paul A. Marks (Medicine and Human Genetics and Development) and Dr. Arthur Bank (Medicine) in the study of the pathogenesis of thalassemia syndromes. Drs. Harold Maurer and Wolff have published with Dr. Paul J. Poppers (Anesthesiology) the results of a study showing reduction of levels of serum bilirubin in neonates as a result of administration of phenobarbital to the mother during pregnancy. An investigation of the effect of smoking by the pregnant woman on the serum bilirubin level of the offspring has been started.

Dr. John C. Sinclair is collaborating with Drs. Robert W. Winters, Ralph B. Dell, L. Stanley James, Gabriel V. Duc and Knud Engel in a trial of the acid-base, osmotic and circulatory effects of rapid correction of pH in acidotic newborn babies. Drs. Gersony, Duc, Dell and Sinclair completed a critique of the assessment of venous admixture in newborn babies with respiratory distress syndrome, and proposed new equations and nomograms for this purpose. Dr. Sinclair is investigating the rate of environmental temperature and thermal gradients in the definition of the neutral thermal state for the human neonate. He also studied the nature, magnitude and effects of the acute and subacute metabolic response to cold in the newborn rabbit, and, with Dr. William A. Blanc (Pathology), described the appearance of brown adipose tissue after newborn rabbits were fasted at contrasting environmental temperatures.

Dr. Gilbert W. Mellin, as director of the Fetal Life Study, has continued to keep a tabulation of all pregnancies registered at the Columbia-Presbyterian Medical Center or the Sloane Clinic. These files have supplied answers to numerous requests for information concerning events during pregnancy and pregnancy outcome. In collaboration with Drs. Ann B. Milic and Karlis Adamsons (Obstetrics and Gynecology), information on sixty-six cases of anencephaly was developed and analyzed. In collaboration with Drs. Celia N. Ores and Irene E. Loewenfeld (Ophthalmology), information concerning pupilllography in infants with cystic fibrosis was also de-

veloped and analyzed. Diagnostic files on the following subjects were established in anticipation of an automated case review: abscess of lung, meningitis, croup, meningococcemia, and orbital cellulitis. In collaboration with Drs. Chryssoula Savopoulou and Katherine Sprunt, an automated review of sixty-one cases of epiglottitis was undertaken.

Dr. Marguerite J. Gates has continued to coordinate the efforts by members of the Departments of Anesthesiology, Neurology, Obstetrics and Gynecology, Ophthalmology, Otolaryngology, Pathology, Pediatrics, and Psychiatry in behalf of the Collaborative Perinatal Research Project. Drs. Elizabeth Ufford, Rhoda Mickey, Camilla Jones, and Susan Fisher have completed the seven-year neuropediatric evaluation of approximately three quarters of the 2,300 children enrolled in the study at Columbia. A summary code will cover pediatric illnesses, physical findings, and significant historical events between one year and eight years of age.

Mrs. Jeannette J. Jansky has completed the research on predicting reading disabilities in a group of four hundred kindergarten children from heterogeneous social backgrounds with intelligence quotients ranging from low to very high.

Dr. Winters and his colleagues have continued their studies of clinical and experimental acid-base disturbances. Drs. Dell and Winters have continued their theoretical and experimental studies of the *in vivo* CO₂ titration curve and the effects of alteration of body composition upon it. In addition, with Dr. William C. Heird, they are also studying the osmotic effects of THAM infusion in the dog. Studies of the net acid balance in normal growing infants and in infants with various acid-base disturbances have been continued by Drs. Engel, James C. M. Chan, and Winters. Parallel studies on net acid balance in semistarvation have been undertaken in the dog by Drs. Dell, John W. Balfe, and Winters. The first known example of congenital alveolar hypoventilation in an infant (Ondine's Curse) was detected and studied extensively by Drs. Mellins and Winters. Dr. Carl S. Strande is currently developing a more sophisticated method of determining the concentration of creatinine in serum and urine by utilizing radioisotopes. Drs. Engel and Duc have continued their studies on the effect of organic polyphosphates on the oxygen dissociation curve and the influence of the position of this curve on the oxygenation of the newborn infant.

Dr. John F. Nicholson has continued his investigations of the metabolism of nitrogen in infants.

Dr. Ruth C. Harris' laboratory has continued to monitor the blood galactose levels of known galac-

osemic patients at appropriate intervals and to aid our own and neighboring community hospitals in identifying patients with enzyme defects of galactose or other carbohydrate and amino acid metabolic errors. A study of the action of pre-incubation on the *in vitro* activity of the galactose-1-phosphate uridyl transferase system has been initiated.

Dr. Katherine Sprunt, Miss Grace Leidy and Miss Winifred Redman are continuing their studies of the normal flora of the human oropharynx. Their work has been extended to include investigation of the uses and hazards of oral antibiotics and the causes and prevention of superinfection.

Dr. Irene Stachura, with Mrs. Marta Zahalak, is investigating the effects of metal ions (uranium, lead and silver) on *haemophilus influenzae* transforming DNA and intact cells. Biological, biochemical and electron microscopic studies of the effects of these ions on the DNA and cells are in progress.

Dr. Edward C. Curnen, Jr., assisted by Miss Eru Tanabe, has continued studies of viral infections in infants and children and selected adult patients, particularly those with infections of the central nervous system.

Dr. Gilbert Simon has undertaken a retrospective chart study to evaluate relation between patterns of infection and radiographic and cystoscopic assessment of bladder outlet adequacy. A prospective study will assess the role of empiric outlet widening in girls with recurrent infections whose urethral caliber is normal. The efficacy of a combination of sulfisoxazol and trimethoprim is being tested in the treatment of urinary tract infection in children over six years.

Dr. Carolyn R. Denning continues her collaboration with Drs. Irwin Mandel, Steven Wotman, and Austin Kutscher (School of Dental and Oral Surgery) in the investigation of submaxillary saliva. With Drs. Barbara Underwood and William H. Sebrell (Institute of Nutrition Sciences), she is investigating the vitamin A metabolism, the absorption of fat soluble vitamins, and the role of bile salts in malabsorption in cystic fibrosis. Dr. Martin I. Lifschitz has studied the viscosity of sputum and other body fluids in normal individuals and patients with cystic fibrosis. He has also completed an evaluation of nebulized antibiotics and an investigation of the quantitative interaction of water and sputum in patients with cystic fibrosis.

Drs. George B. Ambrose (Orthopedic Surgery) and Milton Singer are studying the results of surgical treatment in patients with cerebral palsy. Dr. Nathan Kaplan (Rehabilitation Medicine) is investigating the ability of dilute phenol blocks of periph-

eral nerves and motor points to diminish spasticity and facilitate physical therapy in patients with cerebral palsy.

The feasibility study begun last year on the uses of the computer in the Pediatric Out-Patient Clinic by Dr. Dean N. Martin and Dr. Carolkay Lissen-den working with the Advanced Systems Development Division of the International Business Machines Corporation is still going on.

At Harlem Hospital Center, Dr. Erich J. Kahn is investigating sociological factors of children attending the obesity clinic. Dr. Hugh E. Evans, in association with Mr. S. O. Akpata and Mr. A. Baki, is continuing studies of the bacterial flora and immunoglobulin levels in the newborn. He is also investigating serum enzyme inhibitor levels in collaboration with Drs. Michael Levi and Ines Mandl (Obstetrics and Gynecology). With Drs. Leonard Glass and Carmen Mercardo, he has completed a study by a micro technique of erythrocyte sedimentation rates in newborns. Drs. Glass and Sinclair are investigating the effects of differential cooling on growth and cold resistance of infants during the late neonatal period. Dr. Glass together with Miss Normal Kolko and Mrs. Edith North (Social Service) are studying the relationship of socio-economic factors to the incidence of outpatient clinic attendance and rehospitalization of low birth weight infants born in Harlem Hospital Center.

At St. Luke Hospital Center, Dr. Thomas J. Moore is continuing his work on the permeability of the red cell membrane and the mechanism of transport of substances across this membrane.

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Meyer Foundation, Mead Johnson Laboratories, The Miles Hodson Vernon Foundation, National Advertising Manufacturing Company, National Cystic Fibrosis Research Foundation, National Institutes of Health, New York Heart Association, Mr. and Mrs. John O'Handley, Jack S. Rosenberg Memorial Fund, Ross Laboratories, Mr. and Mrs. George Rowe, Le Salon Departmentale de New York Eight and Forty, friends of Peter Tillis, Mr. and Mrs. Howard Tuttle, United Cerebral Palsy of New York City, the United States Public Health Service, The Upjohn Company, Dr. Martin B. Vita, Mrs. Michael Weideger, Welfare Administration, Mr. and Mrs. Frederick Wilson.

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Pharmacology

BRIAN F. HOFFMAN

Hosack Professor and Chairman of the Department • Pharmacologist

There were several changes in the staff of the department during the past year. Dr. Herbert J. Bartelstone was promoted to Professor of Pharmacology and Professor of Dentistry and Director of Clinical Education in the School of Dental and Oral Surgery. Dr. Hwai Sze Fang, Professor of Physiology at the National Taiwan University, joined the department as Visiting Professor to collaborate with Dr. Shih-Chun Wang and Dr. Hsueh-Hwa Wang in studies on regulation of blood flow by structures in the medulla oblongata. Dr. Shoichiro Nosaka, Research Associate, Department of Pathology, Kyoto University Faculty of Medicine, a Fellow of the China Medical Board and recent recipient of the John Perkins Fund Award, joined the department as Research Associate to spend one year working with Dr. S. C. Wang in his studies on hypertension. Dr. Marvin R. Blumenthal was promoted to Adjunct Assistant Professor. Dr. Albert L. Waldo was appointed as Associate in Pharmacology and Dr. Elizabeth E. LeBourhis as Research Associate. Dr. Chok Yung Chai joined the department for four months as Visiting Associate Professor of Pharmacology.

During the year Mr. Richard Freer completed his graduate studies and was awarded the Ph.D. degree; he accepted a position as Instructor of Physiology in the Department of Biochemistry at the University of Colorado School of Medicine. Six new students were admitted as candidates for the Ph.D. degree. They are: Mr. Alexis O. Cherney, Mr. Peter Danilo, Jr., Mr. Richard D. Gordon,

Miss Svetlana Milloy, Mr. Jay R. Wiggins and Dr. Cengiz Oktay, who came from the University of Istanbul. Miss Jui-Chun Chang was designated as the Rudolph Bircher Fellow, supported by a gift from the Sandoz Foundation, and Dr. Sadhana Sathe and Mr. Peter J. S. Chiu were designated as Fellows of the Geigy Foundation. New postdoctoral fellows appointed were Dr. Henry Gelband, Dr. Bhuvaneshwar P. Jaju, Dr. Edward B. Kirsten and Dr. Herman O. Klein. In addition, the appointment of the following postdoctoral trainees was continued: Dr. H. Dix Christensen, Dr. Abbott T. Krieger, Dr. William J. Mandel, Dr. Robert J. Myerburg and Dr. Regina C. de Rosa Stella.

Research

Dr. Wilbur H. Sawyer has continued his studies on the active neurohypophysial peptides of vertebrates. Particular attention is being paid to the oxytocin-like principles found in elasmobranchs. Dr. Maurice Manning, formerly of McGill University and now at the Medical College of Ohio, and his co-workers have collaborated in this study by preparing by solid phase synthesis peptides that could be hypothetical intermediates in the evolution of neurohypophysial hormones.

Mr. Chiu, a graduate student, and Dr. Sawyer have studied an oxytocin analogue synthesized by Dr. V du Vigneaud of Cornell University. Mr. Chiu and Dr. Sawyer have also been collaborating with Dr. William H. Dantzler of the University of Arizona in studies on the ability of probenecid to

inhibit responses by frogs to their antidiuretic hormone, arginine vasotocin.

Dr. Frederick G. Hofmann and Dr. LeBourhis, have continued their studies on the purification and kinetic properties of steroid C-17 α hydroxylase activity. The major focus of the work has been on the solubilization and further purification of the guinea pig testicular C-17 α hydroxylase system. These investigations have been extended to include a study of the comparative distribution and activity of the microsomal enzymes affecting corticosteroid biosynthesis in human, bovine, canine and rodent adrenal tissue.

Dr. Krieger and Dr. Christensen, postdoctoral trainees working with Dr. S. C. Wang, have found that there is an afferent feedback mechanism in the ventrolateral cervical cord which participates in the control of normal respiration. Dr. Jaju, International Research Fellow of the National Institutes of Health, Dr. Kirsten, a postdoctoral trainee, and Dr. S. C. Wang have studied the effects of atropine and scopolamine on the unit activity in the vestibular nucleus which is evoked by electrical or mechanical stimulation of peripheral vestibular receptors.

Dr. S. C. Wang and Dr. Nosaka, a Fellow of the China Medical Board, have begun studies on the mechanism responsible for elevation of blood pressure in rats with spontaneous hypertension. Miss Tsui-Chin Tseng, a graduate student working with Dr. Wang, has continued her studies on the site of action of centrally acting muscle relaxants. Mr. Michael Koss, also working with Dr. Wang, has been concerned with locating in the medulla oblongata those components of the sympathetic nervous system responsible for causing contraction of the nictitating membrane and dilation of the pupillary sphincter.

Dr. Stella, Visiting Fellow from the Escola Paulista de Medicina in San Paulo, Brazil, has collaborated with Dr. Lowell M. Greenbaum in studying the structure and metabolism of a newly discovered agent, PMN-kinin, which is liberated during injury and inflammation. Miss Chang, a graduate student working with Dr. Greenbaum, has investigated many of the functional characteristics of white cells produced during inflammation and, in particular, their ability to form agents such as PMN-kinin. Mr. Edward Engelman, a third year medical student, Miss Marjorie Geller, a summer student from Vassar College, and Mr. Matt Greenbaum, a summer student from Columbia College, also collaborated with Dr. Greenbaum in the exploration of chemical agents released during injury. Dr.

Greenbaum also has conducted a detailed investigation of agents which potentiate or reduce the effects of bradykinin, a polypeptide released during anaphylactic shock which causes bronchoconstriction in certain species. Dr. Greenbaum has initiated studies on the chemical mediators of inflammation which are released into the blood and pericardial fluid following cardiac transplantation in dogs. This work is being carried out in collaboration with Dr. George Zorn and Dr. Harry Bush of the Department of Surgery.

Dr. Arthur L. Bassett, with Drs. Bartelstone and Brian F. Hoffman, has continued his studies of the mechanical properties of isolated mammalian cardiac muscle, emphasizing the means by which autonomic agents influence myocardial contraction through effects on membrane potentials and excitation-contraction coupling mechanisms. Dr. Bassett also has initiated a study of the effect of nicotine on excitation and contraction in normal and failed cardiac muscle. In collaboration with Dr. Robert E. Ten Eick, (Northwestern University Medical School) Dr. Bassett completed a study on the electro-mechanical effects of strophanthidin-3 bro-moacetate, a long acting cardiac glycoside.

Dr. Bassett and Dr. Robert M. Weiss, (Yale University School of Medicine,) completed studies on the effects of ouabain and tetrodotoxin on the mechanical characteristics of isolated mammalian ureter and on the length-tension relationships of ureteral smooth muscle. Recently they have begun work on excitation-contraction coupling in ureteral smooth muscle.

In collaboration with Dr. Chai (National Defense Medical School, Taipei, Taiwan) and Dr. S. C. Wang, Dr. H. H. Wang completed a study on the relative importance of cardiac and peripheral sympathetic activation in the genesis of the carotid occlusion pressor response and, in collaboration with Dr. Marvin R. Blumenthal, she is concluding a study on the correlation between changes in serum enzyme activities and myocardial damage. With Dr. Letty Liu (Anesthesiology), Dr. Wang is beginning a study on the effects of stimulation of medullary vasomotor areas on regional blood flow.

Dr. Norman Kahn continued his studies on the neural control of salivary secretion. In collaboration with Miss Edye Cole, a graduate student in dental hygiene, Dr. Irwin Mandel and Dr. Stephen Wotman of the School of Dental and Oral Surgery, he studied the effect of parasympathetic and sympathetic nerve stimulation on the relationship between sodium and potassium concentrations and flow rate for saliva collected from the cat submaxil-

lary gland. Dr. Kahn, Mr. Allan Wasserman, a first year dental student and Dr. Mandel also are studying the effect of pilocarpine on the protein content of cat submaxillary and parotid saliva. Dr. Kahn and Mr. Sean Palfrey, a second year medical student, have begun a study aimed at locating and characterizing salivatory neurons in the brain stem. In collaboration with Dr. Bartelstone and Dr. Mandel, Dr. Kahn has studied the relationship between the concentration of potassium in cat submaxillary saliva and the occurrence of cardiac arrhythmias during the administration of the digitalis aglycone, acetylstrophanthidin. Recently Dr. Kahn has begun a study, in conjunction with Dr. Bernard Tandler (Case-Western Reserve University) on the light and electronmicroscopic changes which occur in salivary gland tissue during nerve stimulation.

Dr. William G. Kelly, (St. Luke's Hospital) has continued his studies on the metabolism of steroid hormones. Antibodies to aldosterone and estriol have been prepared in assays of competitive protein binding of these steroids in blood. Also, Dr. Kelly has studied the effects of lithium on steroid production both in man and in perfused adrenal glands.

Research collaboration between members of the Department of Pharmacology and investigators in several clinical departments was facilitated by the award of a program project grant to Dr. B. F. Hoffman to support studies on physiologic pharmacology and its clinical applications. As part of this program Dr. Waldo, Dr. James R. Malm (Surgery) and Dr. Gerard A. Kaiser (Surgery) have continued their studies on the use of electrophysiological techniques as adjuncts to usual diagnostic and therapeutic procedures employed in the care of patients undergoing cardiac surgery. Dr. Gelband, working with Dr. Bush (Surgery) and Dr. B. F. Hoffman has begun studies on the electrical activity of single cells in preparations of cardiac tissue obtained from diseased human hearts. Dr. Bush, Dr. Zorn, Dr. Kaiser (Surgery) and Dr. Hoffman have begun studies on the electrophysiological changes in transplanted canine hearts. Dr. Myerburg, working with Dr. B. F. Hoffman, has continued his studies on the electrical properties of the specialized conducting system of the mammalian. Dr. Mandel, in collaboration with Dr. J. Thomas Bigger, Jr. (Medicine) has continued studies on the mode of action of lidocaine and other antiarrhythmic agents and, with Dr. Bigger and Dr. Vincent P. Butler (Medicine) has begun studies on the electrophysiological effects of an antibody to digoxin. Dr. Sathe and Dr. B. F. Hoffman have begun studies

on the mechanism of desensitization of cholinergic receptors. Mrs. Stephanie P. April, a graduate student working with Dr. Harry Grundfest (Neurology) and Dr. B. F. Hoffman, is studying the effect of variations in the ionic composition of extracellular fluid on neuromuscular transmission in crustaceans.

Activities

Dr. H. H. Wang spent two months as Visiting Professor with the Department of Biophysics of the National Medical Defense School in Taipai, Taiwan. Dr. Sawyer was a participant in the United States-Japan seminar on endocrine glands and osmoregulation of fishes held in Tokyo, which was supported by the United States-Japan Cooperative Science Program. He has continued to serve on the editorial boards of *Endocrinology* and the *Journal of General and Comparative Endocrinology*. Dr. S. C. Wang attended the IVth International Congress of Pharmacology at Basel, Switzerland, July, 1969 and also spoke on the mechanism of antipyretic action of aspirin to a joint audience of the Knoll Laboratories at Ludwigshafen and the Department of Pharmacology, University of Mannheim Medical Faculty. Dr. Bassett received a Research Career Development Award from the National Heart Institute and was elected to membership in the American Society for Pharmacology and Experimental Therapeutics.

Dr. Kahn lectured at the Istituto di Fisiologia of the University of Catania, Italy. Dr. Kahn has continued to serve on the Editorial Advisory Board of the *International Journal of Neuropharmacology* and the Board of Directors of the New York State Society for Medical Research. Dr. Greenbaum was appointed a member of the Public Affairs Committee of the American Society for Pharmacology and Experimental Therapeutics. He participated in the IVth International Congress of Pharmacology held in Basel, Switzerland, and was one of the organizers of the International Symposium on Cardiovascular and Neuroactions of Kinins in Florence, Italy. Dr. Greenbaum was designated as Director of the department training grant in pharmacology.

Dr. F. G. Hofmann continued to serve as a member of the Publications Committee of the Endocrine Society, and a member of the editorial board of *Endocrinology*. He was designated consultant in endocrinology for the forthcoming 22nd edition of *Stedman's Medical Dictionary*. Miss Chang and Mitchell J. Leibowitz (graduate students) presented papers on their research at the Federated Societies of Experimental Biology meet-

ings. Dr. Bartelstone undertook direction of the renovation of the clinical teaching facilities of the School of Dental and Oral Surgery; the new clinic dedicated in September. Dr. Bartelstone also is directing the reorganization of the curriculum for the School of Dental and Oral Surgery.

Dr. B. F. Hoffman was designated as program director for the Medical Scientist Program at the College of Physicians & Surgeons; this program will be supported by a grant from the Institute of General Medical Sciences of the National Institutes of Health for a period of five years. Dr. Hoffman has continued to serve as a member of the Pharmacology and Toxicology Training Committee of the Institute of General Medical Sciences, as a Corporate Member and Director of the New York Heart Association and as a member of its Advisory Committee on Research.

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Pharmacology

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Physiology

JOHN V. TAGGART

Dalton Professor and Chairman of the Department

We record with regret the death on August 26th of Magnus I. Gregersen, who served as professor and chairman of the department from 1937 to 1961 and as the John C. Dalton Professor of Physiology from 1945 to the time of his death. A distinguished investigator in the fields of body fluids, hemorrheology and shock, Dr. Gregersen was also a man of broad cultural interests and deep humanitarian instincts. His presence will be missed by the colleagues and students for whom he provided intellectual stimulation and leadership during his thirty-two years at P & S.

There were several changes in the staff during the past year. Drs. Shu Chien and David Schachter were promoted to Professor, Dr. Arthur Karlin was promoted to Associate Professor and Dr. Sidney Socolar to Assistant Professor. Dr. George Krauthamer resigned to join the Department of Anatomy at Rutgers.

Dr. John V. Taggart served as President of the Harvey Society and was appointed as consultant to the Office of the Director of the National Institutes of Health. Dr. Werner Loewenstein continued as an editor of *Biophysica et Biochimica Acta* and the *Handbook of Sensory Physiology* and as Editor-in-Chief of the *Journal of Membrane Biology*. He organized and chaired the NATO Advanced Institute on Biological Membranes at Stresa, Italy, and was chairman of the Conference on Membrane Aspects of the Immune Response at Titisee, Germany. Dr. William Nastuk was appointed to the Faculty of

Engineering and continued to serve on the Medical Advisory Board of the Myasthenia Gravis Foundation. Dr. David Schachter was elected to the Interim Council of the Faculty of Medicine and the Senate of Columbia University. Dr. Louis Cizek continued as managing editor of *Proceedings of the Society for Experimental Biology and Medicine* and as secretary-treasurer of the Society.

Mrs. Bonnie Rubin completed her graduate studies and received the Doctor of Philosophy. Twelve candidates for the Ph.D. in physiology are currently in residence. Seventeen postdoctoral fellows and visiting scientists participated in the research activities of the department, and five medical and dental students engaged in elective research.

Research

Drs. Gregersen, Shu Chien, Shunichi Usami and Robert Dellenback continued their investigations on the role of erythrocyte deformation and erythrocyte aggregation in regulating blood viscosity at near zero-flow conditions. The effect of purified fibrinogen on blood viscosity has been studied in man, dog and elephant. Drs. Usami, Chien and Gregersen evaluated the potential usefulness of a stroma-free hemoglobin solution as a plasma expander. Drs. Chien and Usami, with Dr. John Bertles of St. Luke's Hospital, completed a study on the viscometric behavior of irreversibly sickled cells from patients with sickle cell anemia. In collaboration with Dr. Louis Miller (Parasitology), Drs. Chien

and Usami have begun a study on the effect of experimental malaria on blood viscosity in the monkey. Drs. Cyrus Bryant and Chien have continued their investigation on the resistance of erythrocyte membrane to mechanical strain when red cells are forced under pressure through filters with 2 to 4 micron pores. Dr. Kung-Ming Jan, graduate student, has studied the quantitative relation between the molecular weight of dextrans and their effectiveness in causing erythrocyte aggregation. With Dr. Anthony Benis (Chemical Engineering), Drs. Chien, Usami and Dellenback have studied pressure-flow relations and tissue metabolism in hind paws of the dog perfused with blood and blood substitutes. Drs. Dellenback, Usami, Chien and Gregersen completed a study on the influence of the spleen on plasma proteins, blood volume and other hematologic parameters in pure bred beagles. Drs. Dellenback and Chien studied the ultraviolet absorption of purified dog fibrin and analyzed the factors involved in accurate quantitation of plasma fibrinogen. Drs. Chien, Usami, Dellenback and Jan continued studies on circulatory, metabolic and endocrine changes in hemorrhagic shock in monkeys.

The laboratory under Dr. Loewenstein continued work on the mechanisms and functional roles of communication through cell junctions. Dr. Socolar, Dr. Alberto Politoff of the University of Chile, and Mr. Steven Strauss, medical student, studied the effects of intracellular electrical fields on junctional membrane permeability. Dr. Gilberto Castro, visiting fellow from the University of Brazil, is investigating the action of magnesium and trivalent cations on junctional membrane permeability. Miss Birgit Rose, graduate student from the University of Munich, discovered that substitution of extracellular sodium with lithium, or treatment with caffeine, two conditions expected to raise the intracellular level of free calcium, produced interruption of communication. In a comparative study of junctional communication in various types of cancerous and normal cells in culture, Dr. Carmia Borek and Dr. Shoji Higashino found that cancerous liver cells lack communication, whereas their normal counterparts communicate well. Dr. Wolfgang Michalke, visiting fellow from the University of Cologne, is exploring the possible relations between junctional communication and inhibition of DNA synthesis in cultured epithelial cells. Dr. Frederic Rodesch, visiting fellow from the University of Brussels, is studying the patterns of communication in differentiating cultured retina cells.

Dr. Nastuk and his associates have continued their studies of the effect of drugs and other agents

on postjunctional membrane receptors and other elements involved in neuromuscular transmission. Dr. Aaron Gissen (Anesthesiology) has completed his investigations of germine diacetate and decamethonium on neuromuscular transmission. Dr. Johannes Karis (Anesthesiology) has completed an investigation of neostigmine and its diethyl analogue and, in collaboration with Dr. Richard Kitz (Anesthesiology), has continued in a search for a hydrolyzable curare-like neuromuscular blocking agent. Dr. Robert Dunham (Anesthesiology) has begun studies of muscle contractile mechanisms and the action of calcium on receptor inactivation. Drs. Luis Marco and Terry Mikiten have completed their study of the uptake of calcium by depolarized muscle using a histochemical technique. Dr. Marco has extended his study of sarcomeric oscillations in muscle. John Koester, graduate student, has used voltage clamp techniques to study the postjunctional action of some selected quaternary ammonium compounds. Joel Schiff, graduate student, is beginning a study of the intracellular action of quaternary ammonium compounds applied iontophoretically to single muscle fibers. Alan Edelson, graduate student, is studying the action of dibutyryl cyclic AMP on neuromuscular transmission.

Dr. Schachter and Szloma Kowarski are studying the properties and physiological significance of a vitamin D-induced, calcium-binding protein in the small intestinal mucosa of mammals, which has been implicated in the mechanism for active transport of calcium. Judith Zola, graduate student, continues studies on the mechanism of induction of ferritin synthesis by iron. The molecular basis of sugar transport across cell membranes is being studied in human erythrocytes and bacteria by Dr. Ellen Batt, postdoctoral fellow, and Laura Schlesinger, graduate student, who are investigating the accumulation mechanism for β -galactosides in *E. coli*. This summer, Joseph Manno, medical student at the University of Buffalo, studied the mode of energy coupling for the transport. Matthew Guy, medical student, is studying the biochemical features of the glucose transport mechanism in human erythrocytes.

Drs. Cizek and Mero Nocenti have demonstrated that adrenalectomy abolishes the polyuria-polydipsia induced by salt deficiency in the male rabbit, while replacement with a glucocortical hormone permits the induction and maintenance of this enhanced fluid exchange. The possibility that the inhibition of this syndrome by estrogen is related to altered plasma protein binding of adrenocorticosteroid hormone is being investigated. Completion of studies initiated

by Susan Ratzan, medical student, indicate that estrogens in low to moderate dosages do not increase the mucopolysaccharide content of rabbit skin connective tissue as they do in other species.

Drs. Martin Blank and John Britten have continued their studies of the enzyme believed to be involved in the transport of ions across cell membranes with the aid of Tamara Oksman, who measured the interfacial electrical properties of the enzyme, and Mrs. Eunice Lee, who measured the enzyme activity under different conditions. This summer Stuart Garay, student from Columbia College, examined the effects of various sugars on the enzyme activity. Dr. George Sweeney, visiting assistant professor from McMaster University, completed his studies on the electrical properties of artificial bilayers. Dr. Diana Bach of the Weizmann Institute initiated studies on the effects of interfacial current flow. Dr. Blank and Mrs. Beatrice Lee have continued their investigation of the properties of protein monolayers and of the surface active material in normal lung. During the summer Dr. Blank worked on a new technique for the study of protein films at the Unilever Research Laboratory in the Netherlands. Dr. Britten continued his studies of the metabolic pathways utilized for unsaturated dicarboxylic acids.

Dr. LeRoy Costantin, continuing his investigation of the manner in which activation of the contractile mechanism in frog skeletal muscle spreads inward from the surface of the muscle fiber, has demonstrated that the normal mode of inward spread of contraction involves propagation of the action potential into the depths of the muscle fiber.

In Dr. Raimond Emmers' laboratory advances were made in elucidating the neuro-physiological mechanisms whereby taste can influence food and water consumption. With Dr. Valentine Corpus, it was found that neurons of the thalamic taste nucleus inhibit the activity of osmoreceptors in the supraoptic nucleus and exert a cyclical inhibitory-excitatory effect on the hypothalamic "feeding neurons". Work on the somesthetic system was continued by two

graduate students. Christina Sakaer and Kathleen Tomasulo. John Woolsey prepared illustrations for a book on somesthetic systems in the rat and man.

Dr. Richard Mason, working in part with the group associated with Dr. Stanley E. Bradley (Medicine), has continued his studies of the functional aspects of compensatory renal hypertrophy. In addition, *in vivo* and *in vitro* studies done by Walter Stingle, medical student, have resulted in a much better understanding of the physiology of urinary bladder muscle. Work by Dr. David Schwartz (Urology), has provided interesting leads to the role of the renin-angiotensin system in experimental renal hypertension and has resulted in a new method of measuring angiotensin in plasma.

Radioactive labeling of the acetylcholine receptor in the electroplax has been accomplished by Dr. Arthur Karlin in association with Drs. Joav Prives, Frances Yim, Walter Deal, Hai Won Chang, and Mitchell Winnik (Neurology); this procedure should facilitate the isolation of the receptor.

Dr. Paul Witkovsky (Ophthalmology), continuing his studies on the synaptic connections in carp retina has used the electron microscope to demonstrate centrifugal fibers in the inner plexiform layer. A collaborative effort on the neurophysiological basis of feeding in the pigeon continues with Dr. Zeigler of the Department of Psychology at City University of New York.

Major Donors

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Psychiatry

LAWRENCE C. KOLB

Professor and Chairman of the Department • Director of Service

With great regret we report the resignation of Dr. Viola W. Bernard, Director of the Division of Community and Social Psychiatry, from this post. Dr. Bernard was responsible for the organization and development of this interdepartmental division, unifying the educational and research efforts of this department and the Department of Public Health and Administrative Medicine in this important new subspecialty area.

Founded in 1956, the division was the first of its kind in the medical schools of the United States. Some 102 psychiatrists, of whom 81 have completed their studies, have undertaken subspecialty education within the various programs developed by Dr. Bernard. The investigations initiated within the division and particularly those evolving from the Columbia Washington Heights Mental Health project have been of major significance in comprehension of the issues involved in delivery of psychiatric services. The talents of Dr. Bernard and her associates, gained through their research and educational experience in this area, have been widely applied on the national and local scenes in development of educational, research, and service programs in community psychiatry. The majority of those psychiatrists who completed their studies with the division within the past decade now hold important posts in national, state, and local services and educational institutions. It is a pleasure to state that she will continue her appointment in the department as Clinical Professor of Psychiatry, active both in the educational process and in research. Pending the

selection of a successor to the post of director of the division, Dr. Shervert J. Frazier has been appointed to act.

Dr. George A. Jervis retired as Clinical Professor but retains appointment as Special Lecturer in the department. The members of the department wish to express particularly their appreciation of the outstanding teaching and investigative work that he has done in the field of mental retardation. He has been honored many times for his signal contributions. In December, 1968 he received the Distinguished Scientific Award of the Association for Research in Nervous and Mental Disease.

Dr. Warren M. Sperry, longtime chief of the laboratory of biochemistry at the New York State Psychiatric Institute, and Professor of Biochemistry was advanced to emeritus rank on his retirement on June 30, 1959. With the retirement of Dr. Sperry the laboratories of biochemistry, pharmacology and microbiology in the New York State Psychiatric Institute, and Dr. Gerald Cohen's group in molecular pharmacology have been combined to create a new division, the Division of Neuroscience, with Dr. Maurice M. Rapport as its chief.

Dr. John D. Rainer was appointed Chief of Psychiatric Research, Medical Genetics, at the Psychiatric Institute. He had been Acting Chief since the death of Dr. Franz J. Kallmann in 1965. Dr. Rainer will be affiliated with the new Department of Human Genetics and Development.

Dr. Murray Glusman has been appointed Director of the Interdisciplinary Post-Doctoral Research

Training Program in the Biological Sciences Relevant to Mental Health. Under his direction, the program has been expanded from an intramural program at the Psychiatric Institute to a program involving many departments at the Medical Center, as well as at the University.

During the spring the faculty committee on medical education, under the chairmanship of Dr. Phillip Polatin worked vigorously to organize and arrange instructorships for new undergraduate curriculum in psychiatry commencing in September, 1969. There has occurred a major shift from lecture to small group teaching in the preclinical years, and a considerable expansion of the elective program in the clinical years.

The departmental executive committee has appointed an *ad hoc* committee composed of Drs. Shervert J. Frazier, Chairman, Dr. Robert Michels and Dr. Donald Kornfeld to review and recommend changes in the medical center residency programs in psychiatry.

Dr. Seymour S. Kety gave the First Heinrich Waelsch Lecture in Neuroscience at the Psychiatric Institute on October 10, 1969 on protein and amine metabolism in the brain. Professor Rene Dubos delivered the Sandor Rado Lecture on November 20th on "Deep are the Roots: The Biological Basis of Individuality." Dr. Sidney Malitz was elected President of the New York County District Branch of the American Psychiatric Association and Vice Chairman of the Council on Research and Development of the American Psychiatric Association. Dr. Maurice M. Rapport was appointed editor of the *Journal of Lipid Research*.

Dr. Murray Glusman has been appointed Chairman of the Biological Sciences Training Committee at the National Institute of Mental Health and also President of the Provisional Executive Committee of the Council of Research Scientists of the New York State Department of Mental Hygiene. Dr. Ernest Gruenberg was elected Chairman of the Committee on Epidemiology and Social Psychiatry of the World Psychiatric Association.

Dr. L. Erlenmeyer-Kimling was elected to the Board of Directors of the American Eugenics Society. Dr. John D. Rainer was elected to be president-elect of the Eastern Psychiatric Research Association. Dr. Lissy F. Jarvik was appointed to the panel on non-psychiatric hazards of drug abuse, organized on behalf of the National Advisory Mental Health Council, under the joint auspices of the Division of Drug Abuse of the National Institute of Mental Health and the Environmental Mutagen Society Council.

Dr. William A. Schonfeld received the distinguished service award, American Society for Adolescent Psychiatry, in May 1969. He was also Visiting Professor of Adolescent Psychiatry of the University of Buffalo School of Medicine in November 1968.

The American Society of Clinical Hypnosis conferred upon Dr. Herbert Spiegel the 1968 award for outstanding contributions in the areas of teaching, research and clinical hypnotherapy.

A plaque commemorating Dr. Heinrich B. Waelsch was unveiled in the New York State Psychiatric Institute just preceding the First Heinrich Waelsch Lecture in Neuroscience, to be displayed in the Division of Neuroscience laboratories.

Research

The department continues its broad investigative programs in the attempt to further understand the relevant factors underlying psychopathology, its influence on social adaptation and the values of various continuing and new therapeutic measures. These researches are reported in order as pursued from the broad general categories of the clinical, psychosocial and biological sciences.

Clinical Sciences

Dr. Ronald R. Fieve and his co-workers Dr. Leslie Baer and Dr. Stanley Platman report a number of research activities. One study was devoted to a possible long-term side effect of goiter and thyroid pathology in manic-depressive patients who had been on long-term lithium carbonate therapy. A follow-up study revealed similar findings in manic-depressive patients treated with imipramine. A third study was unable to demonstrate goiter formation in humans or animals from lithium treatment, suggesting that there are no serious or frequent thyroid complications of lithium therapy.

The investigation of the biochemical aspects of lithium in affective disorders has continued, with emphasis on lithium's relationship to other cations and to catecholamines, as well as its effect on the cellular membrane and on metabolism in mania. The effect of sodium and fluid intake on lithium retention and excretion was examined, and showed the importance of strict metabolic controls in interpreting studies of lithium metabolism.

The electrolyte actions of lithium continue to be studied in patients and changes in electrolyte balance and electrolyte distribution induced by lithium administration have been studied in the laboratories.

A study in which methysergide was used to treat acute mania elicited no favorable patient response,

whereas double-blind substitution of lithium caused rapid abatement of manic symptoms in these patients. The effects of lithium administration on turnover rates of norepinephrine in the brain and heart of rats was studied by Drs. Stern, Neff and Costs. A comparative blind study with Dr. Glassman involved combinations of an MAO inhibitor with tryptophan and an MAO inhibitor with placebo.

Experiments were conducted with Drs. Meltzer and Taylor on the effect of rubidium chloride on monkeys. In collaboration with Dr. John Laragh (Medicine), Dr. Baer has continued his studies of hypertension and hyperaldosteronism. A method for determining rubidium by atomic absorption spectroscopy was developed by Miss Ellen Sutter. To supplement studies cited above, very sensitive analytical procedures have been developed by Dr. Kenneth Lieberman for the determination of lithium, rubidium and other elements of interest in human and rat brains. The procedures developed utilize a combination of nuclear and atomic absorption techniques which will be used to map the concentrations of the elements of interest with the brain and in subcellular fractions of the brain.

A number of psychological studies conducted with the assistance of psychologists, Drs. Robert Plutchik and William Lawlor, are concerned with a direct comparison of emotion profiles obtained from a group of manic-depressive patients and profiles based on staff ratings.

Dr. Sidney Malitz and his colleagues Drs. Maureen Kanzler, James Perel, Ralph Wharton and Phil Zeidenberg have continued and expanded the research of the late Dr. William A. Horwitz in the treatment of depression. Dr. Malitz' group is studying the genetic differences in response to anti-depressant drugs in patients and their families.

In collaboration with Dr. Melvin D. Yahr (Neurology), Drs. Malitz, Kanzler, Wharton and Zeidenberg have been administering L-Dopa to depressed patients. Drs. Kanzler and Malitz are refining behavior assessment procedures to determine which behaviors are most and least modified during a course of treatment with combined brief psychotherapy and medication. Patient self assessment scales have been developed to parallel those used by the physician.

Dr. James Perel has studied the placental transfer of 7-hydroxychlorpromazine in pregnant sheep and guinea pigs. This metabolite has been implicated in various side effects associated with prolonged phenothiazine administration in humans.

Dr. Reginald Taylor, in collaboration with Dr.

Herbert L. Meltzer has studied the effect of rubidium on the electroencephalograms of monkeys.

Dr. Malitz, in collaboration with Drs. Kanzler, Wharton, Zeidenberg, Clif Howard, Virginia Lozzi, Phil Mertz, Barbara Rosenfeld have completed a three and one-half year controlled, double-blind study of 203 out-patients with seven anti-depressant treatments. Dr. Malitz and his colleagues have treated 1,517 patients for a total of 2,114 visits in the Psychiatry Medication Clinic over the last year.

Drs. Donald S. Kornfeld, Stanley Heller and Kenneth Frank, continue their comprehensive examination of the psychiatric complications of open-heart surgery. In cooperation with the Mended Hearts Society, a national organization of patients who have undergone open-heart surgery, they have prepared a questionnaire designed to examine the post-operative experiences and observations of those patients. Approximately 800 of their 1,500 members have completed these questionnaires. The data has not yet been analyzed.

Drs. Steven Katz and Donald S. Kornfeld in collaboration with Dr. Paul Harris of the Department of Surgery, have completed their study of gastrointestinal bleeding after cardiac surgery. They are analyzing their data to determine what specific factors increase the likelihood of hemorrhage.

Dr. Richard Friedman (Psychiatry) has begun a study to determine what effect sleep deprivation and chronic stress have upon the performance of interns working in the Emergency Room. With the cooperation of the Department of Medicine and Surgery their interns will be tested with psychological test instruments designed for this specific purpose.

Drs. O'Connor, Coen, Druss, Levay and Mrs. Stern are involved in a study to determine the effects of psychotherapy and psychoanalysis in the treatment of the functional sexual disorders.

Drs. Jerome Steiner and Sidney Malitz are evaluating psychotropic medications, and the efficacy of group treatment for maintenance of chronic psychiatric patients.

Dr. Florence Liben has compiled and analyzed socio- and psycho-dynamic factors related to out-of-wedlock pregnancy in a sample of women attending the prenatal clinic at Sloan's outpatient service.

Drs. Leah Beck and Mary MacKay completed the pilot study to determine the effects of minimal doses of methylphenidate (Ritalin, CIBA) on children who exhibit neurologic immaturity.

Dr. Robert Michels has participated in an ongoing research project at the Student Health Service, exploring the adaptation of adolescents to the college experience and developing techniques for

predicting which students will develop psychological problems in this setting.

Dr. Herbert Spiegel has studied 1200 consecutive cases under hypnosis and discovered an eye-roll sign correlates with hypnotizability in about 8 out of 10 cases. A hypnotic induction profile has been developed as a clinical test that enables a measurement of hypnotic trance capacity. A technic for habit control (cigarette smoking) was developed.

Dr. Robert Spitzer and his colleagues have devised several forms as part of a multi-state project for automating psychiatric case records. These forms are designed to permit the clinician to record the results of his psychiatric examination which can be used as input to a computer. Although the input is in the form of pre-coded categories, computer programs have been written which enable the computer to process the information and produce an English language narrative which can be used as the official medical record. These forms are now being tried in several psychiatric hospitals in six northeast states.

Dr. Nathan S. Kline reports that eight psychiatric facilities, in addition to his own hospital, now are tied in to the Rockland Computer Center. Activated terminals are feeding patient data to the Center from hospitals in Maine, Massachusetts, Vermont, New Hampshire, Connecticut and New York. It is expected that five new terminals will be activated sometime within the next three months. One of these terminals will be located at Psychiatric Institute.

Another development in the Rockland program involves the establishment of a primate facility on an island in Bermuda. The latter project is a cooperative venture involving Rockland's cooperation with several foundations and Dr. Jose Delgado of Yale University. The focus of the project is electro and chemical stimulation of computer-linked Gibbon apes. From the project should derive a better understanding of brain functioning and basic human behavior.

In a lithium research project being carried out in cooperation with Dr. Bernard M. Wagner (Pathology) various organs of rats were examined using electron microscopy techniques.

Psychosocial Research

Dr. Daniel Stern has been studying the relationship between primiparous mothers and their newborn infants by micro-kinetic analysis of videotaped records of their interactions during feeding. These investigations are important because they will illuminate the earliest stages of ego development and also because of the controversy as to the de-

gree to which the activity of infants is controlled by constitutional as compared with experiential factors.

Dr. Richard Blumenthal in collaboration with Dr. Marvin Herz has been employing role-playing, and confrontation of the patients with video-taped records of the interaction, to learn how psychiatric patients with substantial ego deficits can be trained in coping techniques to favor adaptation outside the hospital. Dr. George Luhrmann and Dr. Howard Hunt are applying similar techniques to the study of interactions in group therapy and other ward activities, and to investigation of the factors in the ward situation that initiate and maintain pathological, symptomatic behavior among psychiatric in-patients.

Dr. Crawford Clark is extending his studies of pain perception by investigating the responsiveness of the autonomic nervous system to external painful stimuli.

Dr. Donald Dillon is studying the retention of newly learned verbal material after an interpolated period of sleep as compared to an equivalent period of waking activity and also to the replaying of the material to the subject during the sleep period.

Dr. Jacques Rutschmann has continued his studies of central nervous system integration, as revealed by the processing of sensory inputs. Dr. Ronald Hutchings is studying the effects of maternal stress on emotion development in rats.

Dr. John Gibbon has continued the development of his general theory of aversively controlled behavior which emphasizes the contribution of proximity to "safe" (i.e. shock-free) periods rather than proximity to shock in the aversive control of behavior. This theory is of importance not only for understanding of aversively controlled behavior as such, but also for the understanding of personality and defenses in man.

Drs. Thetford and Schucman are extending their application of the personality assessment system to normal subjects. They are also continuing their studies of measured abilities in migraine and ulcerative colitis patients by comparing them with normal groups as well as with each other.

Dr. Bruce Dohrenwend reports that analyses of interview data collected from 500 persons by 15 psychiatrists is now well underway as a part of a program of research on relations between social factors and psychiatric disorder, which study is conducted by Dr. Dohrenwend in collaboration with Drs. Edwin Chin-Shong, DeWitt L. Crandell, Gladys Egri, and Frederick Mendelsohn, and Miss Janet Stokes.

Dr. Ernest Gruenberg continues his studies of Washington Heights residents admitted to a state mental hospital during the three fiscal years ending March 31, 1964, 1965 and 1966. Dr. Leo Srole has in preparation the third volume of the Midtown Manhattan Study which focusses on the epidemiology of interpersonal alienation ("anomia").

Biological Research

Dr. John Rainer, together with Mrs. Rita Shandefeld and Dr. M. Bruce Sarlin, began a study of the families of schizophrenic patients who were raised in adoptive or foster homes. Conducted in collaboration with Dr. Paul Wender of the National Institute of Mental Health, this study seeks to compare psychopathology in adoptive families with that of biological families of a matched control set of patients. The aim is to assay the relative role of genetic and intrafamilial influences in the pathogenesis of schizophrenia.

Drs. Lissy Jarvik and Takashi Kato are continuing their longitudinal study of senescence. Other staff members collaborating in this work have been Drs. June Blum, James Fosshage and Hasmukh Shah.

Another major activity in the area of cytogenetics has been the study of effects of drugs upon chromosomes. To determine in vivo susceptibility to LSD, Drs. Jarvik and Kato, in collaboration with Dr. Leon Roizin, studied the offspring of six Rhesus macaque monkeys, two controls and four given LSD in the third trimester of pregnancy. Mrs. Emilia Moralishvili participated in this research.

Dr. L. Erlenmeyer-Kimling, together with Dr. Ranier, have administered a battery of individual and group tests to elementary school and high school students for the purpose of pretesting materials to be used with the children of schizophrenic parents and establishing correlations among the tests.

The role of XYY chromosome constitution (males with an extra Y chromosome) was further studied through some unique patients obtained respectively from the twins and from the deaf patients seen in the Department of Genetics. Dr. Rainer, together with Drs. Abdullah, Jarvik and Kato, studied the first pair of identical twins known to have this chromosome anomaly. They had been seen in the department when they were three years old because of petit mal epilepsy in one twin. Thirteen years later this same twin now shows sudden and impulsive aggressive acts preceding by an aura-like sensation and followed by relaxation.

Previous neurotoxic effects of short-term and

long-term administration of hallucinogens by Drs. Roizin, Kaufman, Alexander, Lawler, Gold, Miles and Akai were supplemented with an additional strain of C3H, HeJ mice and macacus rhesus monkeys.

Electrophysiological studies of the effects of LSD on adult and young macacus rhesus monkeys have been conducted by Drs. Taylor and Roizin. Chromosomal investigations are being conducted by Drs. Kato, Jarvik, Roizin and Moralishvili.

"Zebra" bodies which were originally described in the CNS affected by Gargoylism and dyslipidoses have also been observed by Drs. Roizin, Kaufman and Caveness (NIH-NINDS) in cerebral biopsies of macacus rhesus monkeys 20 weeks post x-irradiation. The possible relationship of these fine metamorphic alterations to physicochemical interactions and histometabolic disorders in myelinolytic processes is being further investigated. Comparative and correlated histopathologic, histochemical and electron microscope investigations of postirradiation necrobiotic processes of the CNS are being conducted by Drs. Roizin, Carsten (Brookhaven National Laboratories), Graham (Aeromedical Research Laboratory, New Mexico) and Mr. Liu.

Dr. Kaufman, in cooperation with Dr. Roizin and Mr. Liu, is investigating the possible viral origin of subacute Panencephalitis and Creutzfeldt-Jakob syndrome in two human autopsies. The neuropathological alterations in a human case of infantile neurometabolic alterations and delayed cerebral changes following x-irradiation are being compared by Dr. Kaufman with those occurring in experimental x-irradiation and vitamin E deficiency in an attempt to define their precise pathogenesis. Dr. Kaufman has also undertaken a survey of the causes of organic psychosis in mental state hospital patients with the hope that information will be obtained on the true incidence of Alzheimer's and Pick's diseases, as well as on the significance of multiple small cerebral infarcts in the production of mental illness in older age groups.

A "multifactor" concept of side or toxic effects of phenothiazine agents was developed by Dr. Roizin in cooperation with Drs. Kaufman, Miles and Akai on the basis of human and experimental studies. The former consisted of human biopsy and post-mortem material of patients who had been treated with phenothiazines.

Drs. Dennis Kelly and Murray Glusman have extended their research in neural pain mechanisms and emotional behavior in cats to the primate nervous system.

Drs. Thomas Perera and Glusman are investigat-

ing changes in evoked potential correlates in the development of "savage" behavior following destruction of the hypothalamic ventromedial nucleus in cats.

Drs. Wallace Orlowsky and Murray Glusman are engaged in studying the neural mechanisms responsible for recovery of pain thresholds following destruction of the principal ascending tracks in the lateral tegmentum in cats. They are also assessing the effects of methodological and pharmacological variables on pain thresholds.

Drs. Cornelis Stokman and Murray Glusman are currently studying habituation of hypothalamically-evoked flight responses and the possible aversiveness of the hypothalamic stimulation. They are also studying the modification of the brain-elicited flight responses by manipulation of environmental variables.

Dr. Maurice M. Rapport and his associates, Drs. L. Graf, K. Inoue, H. Kaufman, D. L. McIlwain, M. Raiteri, and Miss Marsh continued their studies of the chemical composition and immunological properties of cell membranes.

Dr. Lenore Kopeloff has continued her studies of the mechanism of action of anti-convulsant drugs with Dr. Joseph G. Chusid (Neurology) and Dr. George Alexander. Dr. Alexander is working with Dr. Kopeloff to establish the biochemical changes in brain during induction of convulsive seizures.

Dr. Benjamin Weiss and Mr. Richard Stiller have synthesized tritium-labelled 1-hydroxy-2-amino-3-ketoctadecane, and important metabolic intermediate in their studies of the biochemistry of long chain bases.

Dr. Herbert Meltzer has collaborated in studies of rubidium ion on the mammalian CNS *in vivo*.

Patient Care—Vanderbilt Clinic

The home care program has continued to expand this year and has been successful in managing selected psychiatric patients in their homes. Approximately 25 cases are being treated at any given time. Close collaboration with the Visiting Nurse Service of New York has continued.

Presbyterian Hospital

On the consultative services of the Presbyterian Hospital, Dr. Stanley Coen, liaison service, is currently attending the urological and the obstetrical and gynecological services.

Dr. Lloyd Hamilton who has been working in the cardiology clinic for a number of years has also recently become psychiatric consultant for our per-

sonnel clinic. This is a new position established for the care of the personnel of the Presbyterian Hospital to make on-the-spot consultations available for the employees of the hospital and ease referrals to Vanderbilt Clinic psychiatrists. Also Dr. Clifton Howard has been appointed as consultant to staff nurses at Presbyterian Hospital.

During the past year Dr. Florence Liben has continued as consultant, primarily to Social Service, for women pregnant out of wedlock attending the prenatal clinic, as well as continuing as one of the multidisciplinary team working with a group of these young unmarried mothers from lower socioeconomic classes to deal with feelings about their pregnancy, as well as "Education for Childbirth."

Service to Patients

Genetic counseling services remain an important function of the department. Over twenty-five new referrals were seen, each for a series of visits, to assist them in reaching decisions regarding marriage or parenthood.

As part of the New York State Mental Health Program for the Deaf administered through the Department of Medical Genetics of the Psychiatric Institute by Drs. John Rainer and Kenneth Alt-schuler, thirty new deaf patients were admitted to the clinic and there were a total of over five hundred visits by patients deaf since birth or early childhood. Some of these patients had formerly been hospitalized at the department's special ward for the deaf at Rockland State Hospital.

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Public Health and Administrative Medicine

MILTON C. MALONEY

Assistant Professor and Acting Chairman of the Department

Dr. Milton C. Maloney was named Acting Director of the School and Acting Assistant Dean for Public Health, effective January 1, 1969. He has continued to play a part in the direction of the national Medicaid and Medicare evaluation studies which have been underway for the past several years. With the appointment on July 1, 1969, of Dr. George Lythcott as Associate Professor of Administrative Medicine and as Associate Dean for Community Affairs, the responsibility for the direction of the Columbia University-Harlem Hospital Center affiliation has been transferred from Dr. Maloney to Dr. Lythcott. Dr. Maloney continues as Consultant to the program.

Research activities of the School continue to reflect awareness of current community health problems and concern for new methods of delivering health services.

Division of Biostatistics

Dr. John W. Fertig took a sabbatical leave during the second semester, during which time he served as statistical consultant in Latin America for the World Health Organization.

The work of the Division on Design of Experiments and Statistical Methods, particularly appropriate to dental research, has continued. Dr. Varma, Dr. Chilton, and Dr. Austin H. Kutscher (Dentistry) have evolved an incomplete block design for

the study of dissolution times of oral lozenges. Dr. Fertig and Dr. Varma have been working on the fitting of linear models to non-orthogonal designs.

The division continues to participate in the varied research problems arising in the Medical Center and associated health facilities.

Division of Community and Social Psychiatry

Dr. Viola W. Bernard resigned as Director of the division effective August 31, 1969. Dr. Bernard continues as a member of the division's faculty.

Dr. Shervert H. Frazier was appointed Acting Director of the division and its programs effective September 1, 1969.

Dr. Kendon W. Smith was appointed Chief, Section on Training for the division effective July 1, 1969. This position carries central responsibility for coordination and administration of the training program.

Dr. Florence G. Liben was promoted to the rank of Assistant Clinical Professor of Psychiatry and was appointed Chief of the Mental Health-Public Health Training Program.

Dr. Gerald Bauman joined the faculty of the division on a half-time basis on September 1, 1969, and was appointed Lecturer in Community and Social Psychiatry.

Dr. Samuel Bullock has resigned as Clinical Pro-

essor of Psychiatry but continues as Lecturer in Psychiatry. Dr. Sheldon Gaylin has resigned as Assistant Clinical Professor of Psychiatry. He continues his participation with the division through field placement supervision of trainees at Grasslands Hospital.

Dr. Archie Foley has been promoted to the rank of Associate Clinical Professor of Psychiatry. He continues to contribute to teaching in the division and participates in curriculum planning. Dr. Foley is Chairman, Department of Psychiatry, the Catholic Medical Center of Brooklyn and Queens.

Dr. Dewitt Crandell has been promoted to the rank of Assistant Clinical Professor of Psychiatry.

Dr. Sheldon Zimberg has been appointed Deputy Director, Rockland County Health and Social Services Complex and continues as Director of Alcoholism unit at the Harlem Hospital Department of Psychiatry.

During 1969 the interdepartment training programs available through the Division of Community and Social Psychiatry have continued essentially as in the past.

Dr. Bruce Dohrenwend has continued studies of social factors in relation to psychiatric disorders in the Social Psychiatry Research Unit. Collaborating in research work with Dr. Dohrenwend are Dr. Edwin Chin-Shong, Dr. Crandell, Dr. Gladys Egri, Dr. Frederick Mendelsohn, and Miss Janet Stokes.

The research program at the Family Development Research Unit has continued with Dr. Mark Flapan as Director of Research and Dr. Bernard as Medical Director.

Dr. Leo Srole continues as Director of the Geel (Belgium) Foster Family Care Project, a collaborative undertaking with the University of Louvain, and was in residence in Geel during February and August.

Throughout the year, Dr. Bernard continued her activities as Chairman, Committee on Community Psychiatry, American Psychoanalytic Association; Chairman, Ad Hoc Committee on Community Psychiatry, New York Psychoanalytic Society.

Dr. Dohrenwend continues as a member of the Epidemiologic Studies Review Committee of the National Institute of Mental Health, and Associate Editor of the *Journal of Health and Social Behavior*.

Division of Environmental Health

Dr. Alvin R. Jacobson was elected a Diplomate of the American Intersociety Academy for the Certification of Sanitarians, Inc., and was reelected President of The Association for the Advancement of Environmental Health in Medical Care Facilities.

He has continued his role as Director of Environmental Health at Harlem Hospital. The following were appointed lecturers in environmental health: Dr. George J. Kupchik, Mr. Jean B. Cropper, Mr. Samuel H. Trichter, Mr. James R. Reed and Mr. Harvey Cohen.

Division of Epidemiology

Dr. Lillian Belmont has been appointed Senior Research Associate in Epidemiology and Associate Research Scientist in Epidemiology of Mental Retardation Unit I. Dr. Bernard C. Challenor has been appointed Assistant Professor of Epidemiology as well as Deputy Director of the Harlem Hospital-Columbia Affiliation Program. Miss Jean A. Goff has been appointed Staff Associate. Dr. Holger H. Hansen, Senior Research Scientist in the Epidemiology Research Unit, has been appointed Assistant in Epidemiology. Dr. Thomas S. Langner has been appointed Professor of Epidemiology (Social Science). Drs. Edward L. Greene, Joseph H. Herson and Jean D. Jameson have received appointments in the Department of Psychiatry as Research Associates and are assigned to Epidemiology.

Dr. Frank Mount has been appointed Principal Research Scientist in Epidemiology of Mental Retardation Unit II, and Dr. Judith Godwin Rabkin as Research Scientist in Epidemiology in the same unit. Dr. Arthur H. Richardson was appointed Senior Research Scientist in Epidemiology of Mental Retardation Unit I. Dr. David Rush was appointed Assistant Professor of Epidemiology (Pediatrics) and Project Director of the Project for the Prevention of Prematurity and Abnormal Development. Dr. James Stebbings has been appointed Instructor in Epidemiology and Dr. Elmer L. Struening has been appointed Director of Epidemiology of Mental Retardation Unit II, New York State Department of Mental Hygiene.

Dr. Ernest Gruenberg is Chairman of the Committee on Nomenclature and Statistics of the American Psychiatric Association and is directing a revision of standard diagnostic classification of the Association. He was elected Chairman of the Committee on Epidemiology and Social Psychiatry of the World Psychiatric Association.

Dr. Benjamin Pasamanick was elected President of the American Orthopsychiatric Association for 1969-70, and is a member of the Editorial Advisory Board of the *Journal of the Society of Biological Psychiatry*.

Dr. Morton Schweitzer has been elected to the Board of Directors, New York Blood Center, and to the American Epidemiological Society.

Dr. Mervyn Susser visited the Netherlands, in

particular the Universities of Leiden and Tilburg, in order to set up a study of the long-term effects on infants in utero of the Dutch famine of 1944/5. He was elected a member of the Committee on Epidemiology and Social Psychiatry of the World Psychiatric Association.

Dr. Albrecht's Air Pollution Epidemiologic Research Unit has continued to study the relationship of air pollution to disease.

Dr. Charles E. Cherubin has been engaged in the study of hepatitis in New York City and has worked with Dr. Alfred Prince at the New York Blood Center. Dr. Cherubin has also collaborated with the New York Salmonella Center in the investigation of the epidemiology of salmonellosis in New York City and, in collaboration with Dr. Neu (Medicine) has been studying antibiotic resistance in salmonella infections.

Dr. Gearing continues as project director of the evaluation of methadone maintenance program for treatment of heroin addiction.

Mrs. Anna C. Gelman is continuing a study of narcotics addicts with Dr. Alex Richman. Mrs. Gelman spent her recent sabbatical as Project Director, Multiphasic Screening, American Health Foundation, New York City, and has prepared a report on Multiphasic Screening - 1969 for the foundation.

The Psychiatric Epidemiology Research Unit, directed by Dr. Ernest Gruenberg, is currently conducting research on the following: in-patient care of Washington Heights residents; a two-year follow-up of acute schizophrenic decompensation in Washington Heights, and a follow-up of 10% sample of admissions analysis of Manhattan patients becoming long-stay; a study of the defects in the recognition of equivalent sensory stimuli patterns in adults with mental disorders; incidence of social breakdown syndrome in Dutchess County; survey of the aged in Dutchess County; incidence of mental disorder in a defined population (Lundby).

Dr. Langner is studying the mental health of city children. Having conducted two broad surveys of psychiatric impairment in samples of Manhattan children, his team is beginning a five-year follow-up of children in both samples.

Dr. Schweitzer continues his interests in a study of deaths from coronary heart disease in Washington Heights together with Drs. Bergner and Gearing; a study of Parkinson's disease with Drs. McIvin Yahr and Roger C. Duvoisin of the Department of Neurology; a family study of hypertension together with Dr. Gearing and Dr. George A. Perera of the Department of Medicine.

The New York State Epidemiology of Retarda-
tion Unit I (New York State Department of Mental Hygiene), under the direction of Dr. Stein and with the participation of Dr. Susser, has the effects of maternal nutrition during pregnancy on mental development; the relationship between the reproductive process and mental development; the role of phenylalanine in mental retardation.

On-going projects include a study of the effects of the Dutch famine of 1944/5 on fetus then in utero by Drs. Stein and Susser, with Mr. Marolla, Dr. Richardson, and Dr. Saenger; a study in Harlem of the effects of nutritional supplements during pregnancy in preventing prematurity by Drs. Susser, Stein, Rush, and Christakis; a study linking recorded data of admissions to New York State Schools for the Mentally Retarded with birth records in New York City (Drs. Kassab and Stein); a study of the effects of maternal hyperphenylalanemia during gestation on the child's subsequent mental performance (Drs. Stein and Hansen); and a study of the epidemiology of reading disorders in birth cohorts of children in Aberdeen, Scotland (Dr. Belmont). In addition, Dr. Arthur Richardson is participating in a prevalence study of mental retardation in an area of Brooklyn.

Division of Medical Care Administration

Miss Regina Loewenstein was promoted from Research Associate to Assistant Professor of Administrative Medicine.

Mr. Vernon F. Spencer was promoted to Adjunct Associate Professor of Administrative Medicine. Dr. George I. Lythcott, Associate Dean of the Faculty of Medicine, and Coordinator for Harlem Hospital Center-Columbia University Affiliation Affairs, was appointed Associate Professor of Administrative Medicine.

Dr. Clement C. Clay, Professor of Administrative Medicine and Director of the Graduate Program in Hospital Administration, will retire on January 31, 1970.

Mr. Frank van Dyke completed his study on the administration of the health and medical program for civilian dependents and retirees of the uniformed services. Work was continued on the patterns of medical care expenditures in New York State and, with Miss Virginia Brown, on the home health services study.

Miss Loewenstein completed her methodological study of health interview schedules covering utilization and charges of personal health services. She also proceeded with the analysis of the data from the Medicare and Medicaid evaluation studies.

Mrs. Marjorie Frank chaired a workshop of patterns of collaboration between architects and planning staff of community mental health centers at the annual meeting of the American Orthopsychiatric Association in April, 1969. In 1969 she rejoined the Board of Directors of Altro Workshops, Inc., and she continued to be a member of the American Orthopsychiatric Association and the Board of Directors of the Psychoanalytic Research and Development Fund, Inc.

Institute of Nutrition Sciences

Two new appointments were made: Charlotte N. Wang, Assistant in Public Health Nutrition, and Denise Y. C. Lin Co, Research Associate in Public Health Nutrition. Dr. Robert G. Campbell, Adjunct Assistant Professor of Public Health Nutrition, resigned in November.

Dr. William H. Sebrell, Jr., was Chairman of the panel on Public Health and Nutrition of the White House Conference on Nutrition (December 2-5, 1969), and Dr. George J. Christakis was Vice Chairman. Dr. Sami A. Hashim was a member of the same panel. Dr. Theodore B. Van Itallie participated in the conference as Vice Chairman of the panel on advanced teaching in nutrition.

The research program at the Columbia University-St. Luke's Nutrition Research Center has continued to be concerned primarily with human nutrition and metabolic studies involving lipid and carbohydrate metabolism. Studies are continuing on the regulation of food intake in man, the use of medium chain triglycerides in malabsorption syndromes, and on the deposition and metabolism of odd medium chain length fatty acids (C-9, C-11). Metabolic consequences of bile acid sequestration in man are also being studied.

The following research is in progress in the Nutrition Research Laboratories located in the Columbia University William Black Medical Research Building: Studies of factors influencing the absorption of fat-soluble vitamins are being investigated in model *in vitro* systems and *in vivo* in children with cystic fibrosis; the effect of chronic ingestion of medium-chain triglycerides in the tissue concentration of vitamin A and alpha-tocopherol is being investigated in rats; and the concentration of vitamin A and alpha-tocopherol in human liver tissue from "normal" and diseased subjects.

The program of research on malnutrition in the Near East at the Nutrition Research Center of the American University at Beirut continues with particular emphasis on the many aspects of vitamin A deficiency, protein-calorie malnutrition, trace metal

deficiencies, anemia and iodine deficiency. Practical means for improving nutritional public health practices within the resources of the countries concerned are also being studied there.

Project A. C. T. I. O. N. (Auditing Convenience Techniques Impact on Nutrition) has been broadened to include ascorbic acid determinations in addition to thiamine and riboflavin. Current studies deal with the losses of these vitamins in foods frozen in bulk pans and reheated by various methods used in institutional mass feeding.

Studies have been initiated in the texturization of low-cost protein sources.

Division of Occupational Medicine

Dr. Leonard J. Goldwater retired from Columbia University on January 15, 1969, after 22½ years of service as Professor of Occupational Medicine. Dr. A. Walter Hoover, as Associate Professor of Occupational Medicine, is now serving as head of this division.

Since the retirement of Dr. Goldwater, Dr. Hoover has been continuing the research in the absorption and excretion of mercury. The hospital-based small industry occupational health services program is continuing. This project, in addition to serving 1,600 employees in the Brookdale Hospital Center complex, serves over 100 small industries in the area immediately adjacent to the hospital.

Work has begun on a study of carbon monoxide exposure and absorption in taxi drivers in New York City by Drs. Hoover and Albrecht.

Division of Public Health Education

Dr. George Rosen left at the end of the 1968-69 academic year for his new position as Professor of the History of Medicine at the Yale University School of Medicine. The work of the division has been carried on by Dr. Irving Shapiro and Mr. Robert Wallace.

Division of Public Health Practice

Dr. Arne Barkhuus was appointed Professor of Public Health Practice in charge of a new program in comprehensive health planning. Dr. Harold Applewhite (School of Dental and Oral Surgery) was appointed lecturer and dental consultant to the School of Public Health and Administrative Medicine. Mr. Francis Lindaman was appointed Director of the public health program in continuation education to succeed Dr. Eric Osterberg who died tragically in April, 1969. Dr. Elinor F. Downs was promoted to Associate Professor of Public Health Practice, with special responsibility in the area of

maternal and child health. Dr. Ernest L. Wynder was appointed Adjunct Professor of Public Health Practice and the following public health practitioners were appointed as Lecturers: Drs. Edward D. Coates, Andrew C. Fleck, Jr., David Harris, David Sencer and Leon J. Taubenhaus.

Dr. Herman E. Hilleboe was elected speaker of the Governing Council of the American Public Health Association for a three-year term beginning in 1969. He served as special adviser to the World Health Organization in March, 1969, on global plans for malaria eradication; and spent a six-month sabbatical leave as consultant to the Organization in Geneva, Switzerland, studying national health planning, new curricula for schools of public health and management information systems.

Dr. Elinor F. Downs was appointed by Mayor Lindsay to a special Task Force on Child Abuse, and was elected Secretary of the Maternal and Child Health Section of the American Public Health Association.

Miss Gloria L. A. Dammann spent a three-month sabbatical leave in 1969 studying nursing and social work services in several European countries under a travelship program of the World Health Organization.

Division of Social Services

As a newly organized division within the School of Public Health and Administrative Medicine, the major preliminary efforts have been directed to an examination of the existing curriculum with specific emphasis on content in the social service and community organization areas.

Dr. Maurice Russell, head of the division of the Alumni Conference of the Columbia University School of Social Work for has been appointed by the New York City Commissioner of Hospitals to represent the Department of Hospitals at a seminar group set up by the Mayor between major City Departments and all the Deans of Social Work within the area. Dr. Russell is also a member of the following: the Board of American Orthopsychiatric Association, the Editorial Advisory Committee of *Social Casework*, the Executive Committee of the Board of the New York State Welfare Conference, the Board of Examiners, Certified Social Worker Examination, New York State Education Department, the Professional Advisory Committee, United Hospital Fund of New York City, the Technical Advisory Committee, New York City Health Department, the Advisory Committee of the American Cancer Society, as well as the Boards of several community organizations. He and members of his

staff have also provided consultation to many agencies outside the State during this year.

Division of Sociomedical Sciences

Dr. David Wallace, Assistant Professor, resigned at the end of the 1968-1969 academic year.

Dr. Mata K. Nikias, formerly Adjunct Assistant Professor, has been appointed Assistant Professor. Dr. Harriet Presser has been appointed Assistant Professor assigned to the International Institute for the Study of Human Reproduction. Dr. Presser will be designing a study of urban fertility focusing on the first birth as a determinant of excess fertility. Mrs. Corinne Kirchner was promoted to the position of Research Associate, Mr. Stanley K. Hershaw, Mrs. Barbara Levenson, and Mr. Ramon J. Rivera were appointed Research Associates.

As a consequence of the relationship established by the School last year with the Latin American Center for Medical Administration in Buenos Aires, Argentina, three Argentinian citizens are at the School this year under the general supervision of Dr. Jack Elinson.

The survey, initiated last year, of the public image of mental health services in the wake of the State mental hospital employee's strike was completed.

A project to explore the feasibility of establishing a computer-based community health inventory was completed this year. Such a system might provide a continuing health inventory in the interests of research, evaluation, and policy-making. A final report with recommendations and a grant proposal for implementation is in preparation.

A study to evaluate a comprehensive medical care program offered to 1000 families who are members of teamster locals participating in the Teamsters Joint Council #16 and Management Hospitalization Trust Fund was completed. This study was carried out by Dr. Mildred Morehead and Mrs. Anne Zanes.

The Community Master Sample Survey in Washington Heights is now in its ninth year. The Master Sample Survey continues to serve as a population laboratory for the conduct of sociological and epidemiological research bearing on community health services. Dr. Mata Nikias continued her analysis of trends and patterns of dental care using data from both the 1960 and 1965 Master Sample Surveys. Dr. Jeanne Ridley directed a computer simulation study of human fertility which attempts to give the quantitative effects on natality of various demographic and biological factors, evaluate the sensitivity of natality indices, and investigate sampling problems.

Dr. Ridley also prepared a report analyzing the status of women and family planning in the United States.

Under the direction of Dr. John Colombotos, the long-term research project, entitled Physicians and Medicare: A Study of Attitude Change, has the objectives of examining the effect of the passage of Medicare legislation on physicians' attitudes and examining the conditions under which attitudes change.

Dr. Josephson and Mrs. Brunswick continued their study of adolescent health and medical care needs in Harlem, aimed at contributing to effective planning and delivery of health services to youngsters.

Contracts were negotiated during the past year for two related studies of multiphasic automated testing for health. One will consider consumers' attitudes concerning this program at Brookdale Hospital, health behavioral changes associated with it, and changes which might be made to make the program more acceptable. The other will survey attitudes of physicians in Kings County toward the program, their behavior with regard to the program, how it can be made more acceptable to the physician in private practice and the more general question of physicians' response to automation in medical practice. Working on these studies are Mrs. Levenson and Mr. Henshaw.

A study by Drs. Elinson and Josephson and Mrs. Zanes of teen-age drug behavior in junior and senior high schools across the country was begun to describe and analyze individual changes in behavior over a period with regard to various kinds of drugs, as well as trends in such behavior, with the aim of contributing to programs of education and intervention in drug abuse.

A comparison of women who use family planning clinic services in Washington Heights and women who do not is underway. This study, under the direction of Mr. Haberman, will compare the attitudes, knowledge, and family planning practices of the user and non-user groups.

In addition to sharing in the development and implementation of the clinical assessment program, Mr. Elliott N. Camerman has responsibility for the development of a Vital Statistics Unit which will analyze vital statistics for the Harlem community and comparative data for other low-income areas of New York City.

Under the direction of Miss Patricia Collette, the Harlem Community Health Survey, a continuing household survey of the population of the Harlem Hospital District, began the collection of data re-

lating to self-reported health status, health-related behavior, and personal characteristics of that population in July, 1967. The Community Survey's sampling frame, in addition, has provided samples for the Adolescent Health Project, for the study of use of the Washington Heights Family Planning Clinic, and for a preliminary study of the problems of nutrition, prenatal care, and prematurity by the Division of Epidemiology of the School of Public Health and Administrative Medicine.

The Systematic Record Abstract, a data base for the collection and computer-aided analysis of information from the chart of each of the approximately 20,000 in-patients discharged yearly from the Harlem Hospital Center, began regular production in December. Special studies were prepared relating to alcoholism, stroke, the effects of air pollution, ulcers, pneumonia, pregnancy, and hyperuricemia.

Activities have focused on the Medical Service. Early in the year a period of daily collection, review and analysis of admission statistics for the service was begun. A program of medical record review was executed during the summer, and on September 1 the ongoing program for the collection of data and assessment was implemented. Reports to the hospital on a periodic basis were an essential part of the assessment program.

The Department of Patient Care and Program Evaluation has been and continues to be a resource for teaching and field-placement.

Division of Tropical Medicine

Dr. David N. Reifsnyder has been appointed Instructor in Tropical Medicine. Dr. John D. Frame is continuing his studies on the epidemiology of infectious hepatitis among several thousand missionaries from many countries who are under his medical supervision. Drs. Frame and Harold W. Brown are preparing a study of the effects of long-time chloroquine malaria prophylaxis upon the sight of missionaries and their children. Dr. Louis H. Miller continues his study of the effects of changes in the red cell during malaria on deep vascular schizogony and the pathophysiology of this infection. Dr. Miller spent three months in Africa on malaria research and clinical medicine. Dr. Ashton C. Cuckler continues his extensive chemotherapeutic studies on human and domestic animal parasites. Dr. Roger W. Williams is studying the effects of compounds, active *in vitro* on microfilariae on the development of *Brugia pahangi* in *Aedes aegypti* and the effects of ademine, cystosine, DNA and thymidine on the growth of mosquito larvae and their effects on the development of *B. Pahangi* in mosquitos. Dr. How-

ard B. Shookhoff continues his assessment of a number of chemotherapeutic agents against parasites found in the New York population. Dr. Kathleen L. Hussey is completing her studies on the microsporidian parasites of larval trematodes.

Dr. Brown served as the China Medical Board's consultant in Seoul, Korea, in the building and educational program of the University's School of Public Health. He also served as Chairman of the National Research Council's study section on chemotherapeutic agents for parasitic diseases. He was awarded the Medal of the New York Academy of Medicine for his teaching and research.

Dr. Williams was elected President of the New York Society of Tropical Medicine. He continues to work closely with the WHO Filariasis research program in Rangoon, Burma, and continues to serve as member of the Corporation of the Bermuda Biological Station for Research.

Program of Continuation Education

Continuation Education suffered a severe loss in April with the tragic death of Dr. Eric R. Osterberg, Director for Public Health. His contributions to continuing education in particular and to public health in general were recognized throughout the country. In June Mrs. Noreen Clark was promoted to the position of Curriculum Coordinator, and in September Mr. Francis C. Lindaman was appointed Director of the Program in Public Health. In August Miss Marjorie Costa joined the program as Staff Consultant in Public Health.

Public Health

The continued effort of the Program of Continuation Education to deal with the immediate and crucial problems faced by public health and administrative medicine professionals is reflected in two major thrusts of the program during the past year. The first is the concern for planning for the delivery of health services and the second an emphasis on the problems of the inner city.

Mr. Lindaman presented a paper on staff training and the working relationships of providers and consumers in Spanish Harlem at the meeting of the American Public Health Association, based on a compilation of results of the courses conducted in

the inner city for improving community and health center relationships.

Administrative Medicine

A series of courses were conducted by the administrative medicine program for new professional staff members of the New York State Department of Health. They were designed to bring the participants up to date on activities in health care administration, primarily as they relate to Public Law 89-97 and the recent Social Security Amendment.

Other courses included basic hospital architecture for practising architects; medical care administration for high level executives, nursing home administration and management development for hospital executives.

Major donors to the research program were The National Institute of Mental Health, The New York City Community Mental Health Board, The Josiah H. Macy, Jr., Foundation, The New York State Department of Mental Hygiene, The Faigel Leah Foundation, Inc., The Grant Foundation, Inc., The Kennedy Foundation, Inc., The Honorable John D. J. Moore, The Tappanz Foundation, United States Department of Health, Education and Welfare National Center for Health Services Research and Development, Social Security Administration, Social and Rehabilitation Service, United States Public Health Service, Associated Hospital Service of New York, Health Research Council of the City of New York, New York State and New York City Departments of Health, National Institute of Child Health and Human Development, Social and Rehabilitation Service of the Health, Education and Welfare Department, National Library of Medicine, New York State Narcotics Control Commission, Agency of International Development, Campbell Soup Company, Coca Cola Company, Columbia University School of Public Health and Administrative Medicine, Foundation of International Child Health, Inc., General Mills, H. J. Heinz Company, Nutrition Foundation, Project ACTION, Whitehall Foundation, Williams-Waterman Research Corporation, United States Center for Air Pollution Control and the Coordinating Research Council, Children's Bureau, and the Research Foundation for Mental Hygiene.

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Radiology

WILLIAM B. SEAMAN

Professor and Chairman of the Department • Director of Service

The opening of the School for Radiology Technicians in May was an important step in the solution of the technician shortage. A second class of twelve students matriculated in September. Attempts are being made to improve the efficiency and output of each radiologist by improved equipment and increasing utilization of ancillary personnel. The new angiographic wing is nearing completion. Plans for the new pediatric radiology department have been completed and designs for radiology in the new emergency area are well underway. This will add a total of ten new radiographic rooms and replace three old rooms which will significantly increase our potential patient capacity. This will greatly improve the radiologic service, providing adequate professional and technical staffing can be maintained.

An additional radiographic room was added to the radiological suite in the Atchley Pavilion. A new radiology area in the new addition to the Institute of Ophthalmology was completed in December and consists of two diagnostic rooms plus film reading and processing areas.

Staff Changes

The retirement of Dr. Harold Jacox, Chief of the Radiotherapy Division, occurred in September after twenty-one years of dedicated service; he will be greatly missed. Dr. Hano Siegel completed his residency and joined the attending staff in September. The staff was also augmented by the arrival of Drs. Edward Milikow and William Griffin.

Dr. James Reilly joined the staff and is working in the Division of Nuclear Medicine.

The Radiation Research Laboratory was strengthened by the addition of Dr. Eric Hall from Oxford, England and Dr. Albrecht Kellerer, both radiobiologists. Dr. Carl Steeg joined the staff of the Cardiovascular laboratory.

Teaching Activities

The training programs in neuroradiology, diagnostic radiology, and radiotherapy, all supported by the National Institutes of Health continue to be fully subscribed. Currently, there are twelve Fellows enrolled in this program. In addition, are three Fellows in pediatric radiology enrolled in a program supported by the Children's Bureau.

The postgraduate course in neuroradiology was attended by over 400 physicians from all over the country. The postgraduate course in the radiology of the bones and joints was again conducted by Dr. Meyer Alpert. Additional teaching activities have been undertaken in the Harkness X-ray Department consisting of daily conferences with medical students and house staff on the Medical Service as well as utilization of this facility for the instruction of medical students taking an elective in radiology and radiology residents. The refresher courses on the clinical use of the lung scan were given by Dr. Philip Johnson at two national society meetings.

The Radiological Research Laboratory continues to sponsor the research projects leading to the de-

gree of Ph.D. One candidate received the degree during the year. They also give a course leading to the degree of Master of Science in radiologic physics. There is, at the moment, an enrollment of six students in the class with the current division. This program is supported by grants from the Division of Environmental Control of the United States Public Health Service. A course in radiobiology for radiology residents and graduate students in the life sciences was given by Dr. Eric Hall.

A total of eighteen students are enrolled in the new School for Radiologic Technology.

An increase in the postgraduate teaching at the residency level also took place at the Neurologic Institute where 22 residents from other services rotated through the Neuroradiology Service.

A postgraduate course in ophthalmic neuroradiology was organized by Drs. Stephen L. Trokel and Ernest Wood and was attended by a mixed audience of about 80 ophthalmologists and 400 radiologists and neurologists.

Staff Activities

Dr. David Baker was elected President of the New York Roentgen Society. Dr. William B. Seaman was elected Chairman of the Executive Council of the American Roentgen Ray Society and continues to serve as a member of the Part II Committee of the National Board of Medical Examiners and as a guest examiner of the Medical Board of Radiology. He was recently elected a member of the Committee on Radiology of National Research Council, National Academy of Sciences.

Dr. Kent Ellis was elected Chairman of the Section on the Radiology of the New York State Medical Society.

Dr. Harald Rossi continues his work as Chairman of the Technical Advisory on Radiation for the Mayor of the City of New York and as a member of the Advisory Committee on Isotope Distribution of the Atomic Energy Commission. He is a member of the Main Commission of the International Commission on Radiation Units and Measurements and of the Main Council of the National Council on Radiation Protection and Measurements. He is also Chairman of the Standing Committee on Radiation Biology Aspects of the Supersonic Transport.

Dr. William Gross continues his activities as a member of a Task Force on "Dose as a Function of LET" of the International Commission on Radiological Units and Measurements. Dr. Albrecht Kelleher served on a Committee on "Fundamental Quantities and Units" of the same International Commission.

Research Activities

Division of Diagnostic Radiology

Dr. Kent Ellis has completed an analysis of the radiographic features of constrictive pericarditis including the consequence of treatment. With Dr. Welton Gersony (Pediatrics), he is studying idiopathic hypertrophic sub-aortic stenosis in infants and children. The angiographic configuration of the inter-atrial and of the inter-ventricular septa in relationship to predicting relative pressures in the right and left sides of the heart has been carefully studied. An exhibit on this was given at the American Roentgen Ray Society and awarded a Certificate of Merit. Dr. Ellis with Dr. Sidney Blumenthal (Pediatrics) and Dr. James R. Malm (Surgery) has been studying aortic regurgitation in association with ventricular septal defect with emphasis on the roentgen and surgical anatomy.

Dr. Guy Potter has completed a study of the effects of trauma to the facial nerve and facial canal. He is continuing his study of correlating the identity of the structures of the human head with their radiological counterparts using the method of hypocycloidal tomography. He completed an evaluation of the human ear with reference to congenital defects, externally and internally. He has also analyzed the optic canal from both the anatomic and radiologic approaches. Dr. Harvey Hecht with Dr. William Renert is reviewing the lymph node impression upon the duodenal sweep as demonstrated by lymphangiography and barium studies. Dr. Hecht is also evaluating the clinical usefulness of lymphangiography.

Utilization of selective angiography for the clinical evaluation of patients with gastrointestinal bleeding is being pursued by Dr. Ira Kanter, particularly the unusual incidence of bleeding from right-sided colonic diverticula. He is also studying the vascular causes of abdominal pain. The evaluation of phased diastolic angiography is being conducted by Dr. Kanter. This technique permits the lesser amounts of contrast material to be used and it is a greater safety factor. With Dr. Lester Baer and Dr. John Laragh (Medicine), he is studying reno-vascular hypertension utilizing renal vein renin with and without furosemide infusion. With Dr. Paul Cannon (Medicine), xenon-scanning of the kidney is being studied. Dr. William Seaman is analyzing the radiographic appearance of prolapse of the gastric mucosa through a gastro-jejunostomy. He and Dr. William Stiehm are engaged in a laboratory and clinical study of the motor phenomena of the gastrointestinal tract with particular reference to

the esophagus and distal stomach. The radiographic aspects of sclerosing cholangitis have been analyzed by Dr. Jerome Krieger and Dr. William Seaman.

A clinical and experimental study of aqueductal displacement due to posterior fossa tumors was conducted by Dr. Sadek Hilal, Dr. Hagop Tookoian and Dr. Ernest Wood. Drs. Hilal, Wood, William Casarella and Mr. Jack Driller (Riverside Research Institute) have developed a magnetic bronchial catheter which permits selective catheterization of subsegmental and smaller branches of the bronchial tree. The catheter is also suited for passage of various bronchial biopsy devices. The magnetic vascular catheter was further investigated in conjunction with Dr. Jost Michelsen (Neurological Surgery) and Mr. Driller. The research was directed towards finding an application for the catheter both in the diagnostic and therapeutic procedures. It is possible to develop a very small pressure transducer which is placed on the tip of the catheter and can measure pressure. This device has been used in animals and its use in patients for the measurement of the cerebral venous sinuses is in progress. The therapeutic applications conducted in the dog consists of obliterating experimental arterial aneurysms using an electrical current. The regional cerebral blood flow in patients with tumors and arteriovenous malformations is continuing. The vascular response in the brain and in the tumor to various pharmacological agents was studied using the high resolution technique of the densitometric analysis of angiograms.

Research has been started by Dr. Bentley Holander with Dr. Hilal and Dr. Seaman on the practical usefulness of the .05 mm focal spot X-ray tube. A resolution pattern of 20 line pairs per mm was built for the study of the effect of magnification with various screens. Human brains have been injected with the purpose of studying the limit of useful magnification and the problem of super-imposition of small vessels.

Dr. Ernest Wood and Dr. James Correll (Neurological Surgery), have continued their studies of cerebral ischemia. They have found that magnification angiography has been valuable for providing more information about small changes in the distal cerebral arteries. The natural history of ulceration in atherosomatous plaques has been evaluated. The study of cerebral thromboembolic complications from the use of oral contraceptives has been concluded by Drs. Ernest Wood and Richard Bergeron. Dr. Wood continues his investigations of thermography as a means of detecting atherosclerotic carotid insufficiency and evaluating the results of carotid

endarterectomy on a long term follow-up basis. With the help of Dr. Hano Segall and Dr. James Lingley, a large amount of detailed data concerning the thermographic parameters in stroke have been collected. This group is now correlating their thermographic findings with dynamic isotope studies and angiography in an attempt to assess definitively the role of thermography in the diagnosis of stroke. Drs. Wood and Trokel (Ophthalmology) are reviewing patients with occipital lobe lesions diagnosed angiographically and analyzing the differences in the visual field patterns between those with tumors and those with vascular disease. Dr. Trokel, with Drs. Hilal and Michael Tenner have numerous cases of orbital disease studied by orbital phlebography and arteriography. Dr. Trokel with Dr. Philip Johnson is correlating the radiographic findings in unilateral exophthalmos with the results of isotope scanning and orbital sonography.

Dr. Hilal is collaborating with the Department of Orthopedic Surgery in a study of the blood supply of the spinal cord in patients with severe scoliosis. Selective spinal angiography is being carried out on a number of patients prior to surgical spinal fusion. Post-operative spinal angiography will be carried out six months after fusion to see whether the blood supply to the spinal cord may have been improved or otherwise altered.

Dr. David Baker and Dr. Walter Berdon with Dr. Robert Schwartz (University of Rochester) are investigating the Tamm Horsfall urinary mucoprotein in rats who have had kidneys poisoned with Dichromate. With Drs. Joshua Becker and Bruce McClellan, Drs. Berdon and Baker are studying the clearance of iodine from the blood following the intravenous injection of contrast material in infants and children and comparing these results to those obtained in adults to see whether there is any difference in the mechanism in the way contrast material is being handled. With Dr. Thomas Santulli and Dr. Sherman Bull (Surgery), they are investigating midgut malrotation with and without volvulus in an attempt to determine which type of X-ray examination is most useful in making the diagnosis. They are also investigating adrenal disease in infants and children, hydronephrosis in infants and children, and mesonephric adenocarcinoma of the vagina in an infant simulating sarcome botryoides.

Dr. Joshua Becker is evaluating effective high dose urography in patients with renal failure. The transfer of contrast material across the blood brain barrier after intravenous injection has been established. The relationship to the intravenous administered dose is

being investigated. Comparison studies using sodium and methyglucamine salts of contrast agents are being carried out. In cooperation with the Department of Medicine, an active program of adrenal vein catheterization has been undertaken in order to do hormonal and metabolic assays in the evaluation of adrenal disease.

Dr. Thane Asch is studying the association of sprue and carcinoma of the small bowel. He is also evaluating the application of magnetic guided catheters in both bronchography and in the gastro-intestinal tract. He is in charge of the mammography program which is being developed.

Radiotherapy

Our clinical and laboratory effort has been directed towards the study of optimal treatment fractionation for normal tissues as well as for tumors. Dr. Chu Chang, with Dr. Angeline Mastri (Neuropathology) and Dr. Charles Herbert (Radiation Physics) have concluded a study on irradiation of normal cat brain tissues with different fractionation schedules.

Dr. Richard Albanese has been working with Dr. Chang on tissue oxygen diffusion parameters under hyperbaric conditions. They have also started to map tumor re-oxygenation with a micro-electrode technique in experimental tumors undergoing fractionated radiotherapy.

The conversion of the 24 Mev. Betatron for separate production of an electron beam has been completed. Electron beam dosimetric studies have been carried out by Dr. Paul Goodwin and Mr. Charles Herbert. More than 20 cases of advanced cancer of the parotid gland, recurrent or persistent metastatic cervical nodes and cutaneous malignant melanomas have been treated by Dr. Chang with the electron beam.

Dr. Ruth Guttmann is continuing her clinical studies of the effect of radiation on inoperable lung cancer, breast cancer and carcinoma of the bladder, prostate and kidney. A review of the ten year results of radiotherapy of early stage of Hodgkins disease and lymphosarcoma is being prepared. An evaluation and the effect of radiation on patients with advanced carcinoma of the cervix is underway.

Drs. Chang and Wood have reviewed all cases of glioma of the optic pathway treated in this Institution since 1936 regarding long term eye-sight preservation and survival.

Nuclear Medicine

Studies of myocardial perfusion in the normal and acutely infarcted dog heart were continued by Drs.

Philip Johnson and Paul Cannon (Medicine). Using rapid scinti-photography after injection of Xenon-133 into the left coronary artery, the distribution of arterial blood was visualized. Following induction of acute myocardial infarction, myocardial regions deprived of blood supply were no longer demonstrable.

Evaluation of Indium-133m for visualization of the placenta was continued by Drs. Philip Johnson and Solan Chao (Obstetrics and Gynecology).

Dr. James A. Reilly began an investigation designed to determine the correlation between the placental image seen on scintillation scanning and actual placental morphology determined after delivery.

Drs. Philip Johnson and James Reilly have begun to establish quantitative parameters for interpretation of the bone scan as recorded on the digital Autofluoroscope. The goal is to provide a simple, accurate means to determine whether a regional variation in detected radio-activity is statistically significant.

Dr. Gerard Turino and Dr. Philip Johnson undertook an investigation to measure perfusion of the canine lung in the normal state and during acute hemorrhagic shock.

Together with Drs. Robert King and George Myers (Riverside Research Institute), Dr. Philip Johnson continued the development of an isoactivity contour plotter. During the year, the prototype model was assembled and initial trials on phantom scans were begun.

The number of clinical diagnostic procedures continue to increase due largely to the greater demand for time-consuming organ scintillation scans. Bone scanning was introduced as a routine diagnostic procedure. A digital Autofluoroscope was purchased.

Cardiovascular Laboratory

Dr. Welton Gersony with Dr. John Sinclair and Dr. Gabriel Duc of the Department of Pediatrics has been studying the techniques of calculating right to left shunting in newborn infants with the respiratory distress syndrome. He has been devising methods to quantify shunting which arises within the lung from shunts which arise from a patent ductus arteriosus or foramen ovale. More precise estimations of such shunts which can affect peripheral arterial oxygenation and hydrogen ion concentration are essential to an evaluation of therapeutic procedures in this high mortality syndrome.

Dr. Carl Steeg has continued his studies on the

metabolic response to circulatory abnormalities in children. His approach includes the continuous measurement of whole body oxygen consumption in infants and young children at rest and during exercise. Comparison of studies before and after corrective surgery to the cardiovascular disturbance should allow an analysis of the effect of specific circulatory disturbances on the efficiency of oxygen utilization for the performance of muscular work.

Dr. John Burris with Dr. Donald Schmidt and Dr. John Carey, and Dr. Gerard Turino, is studying changes in extravascular lung water content during exercise in patients with pulmonary venous hypertension from valvular heart disease. The rates at which water exchanges occur in response to changes in hydrostatic pressure as well as the reductions in extravascular lung water in response to acute diureses are being investigated.

Dr. Gerard Turino in collaboration with Dr. Albert Waldo, Dr. Samuel Shubrooks and Dr. Carl Steeg has been studying the effects of hemorrhagic shock in dogs on the distribution of pulmonary blood flow and its hemodynamics. This study is being directed to an exploration of the effect of hypoperfusion of the lung on pulmonary vascular resistance and on the distribution of pulmonary perfusion and ventilation. An integral part of this study involves the use of high-speed scintillation scanning of the lung to determine distribution of blood flow and of inspired air in the lung during states of low pulmonary perfusion, high pulmonary perfusion and normal perfusion in anesthetized dogs. It is planned to extend these techniques for estimating pulmonary blood flow to clinical states involving intracardiac shunts and disturbances in perfusion of the lung.

Radiological Research Laboratory

Research at the Radiological Research Laboratory of the Department of Radiology is conducted in the general areas of radiological physics, biophysics, and radiobiology. The over-all effort of the laboratory is designed to establish a quantitative connection between the detailed manner in which absorbed dose is deposited and the biological effects that are observed.

The Radiological Research Facility has progressed sufficiently in Brookhaven to begin experiments in radiological physics and radiobiology. This is a joint enterprise between scientists from the Medical Department of Brookhaven National Laboratory and members of the Radiological Research Laboratory. The Van de Graff accelerator can produce a terminal potential of five million volts. To date,

proton beam currents of several hundred uA at 3.5 MeV have been achieved. Good quality water cooled tritium targets have been developed to generate monoenergetic neutrons from a fraction of a MeV to about 2 MeV. Dose rates up to 50 rad per hour at 10 cm are available with the horizontal proton beam. Irradiations of *Drosophila* and *Tradescantia* and supporting dosimetry studies have been made.

The investigation into the possible therapeutic use of neutrons was concluded with a second series of measurements performed at the Texas A & M Variable Energy Cyclotron. These studies were made with the spectra obtained from beryllium irradiated by ^2H ions with energies in the range of 15 to 35 MeV. Both thick and thin targets were utilized. The principal conclusion of this work was that, for the reaction studied, a deuteron beam energy of at least about 30 MeV is required to obtain 50 percent of the surface dose at a depth of 10 cm. in tissue.

The investigation of the distribution of energy deposited in small tissue-equivalent spheres has continued in the last year and final data are being analyzed. Measurements of the energy deposition pattern in tissue spheres having diameters of 2, 1, 0.5, 0.25 and 0.125 microns have been completed for ^{60}Co gamma rays with the use of a recently developed system. The spectrum which results from fluctuations in the energy deposited extends over three decades.

Tests of "wall-less" spherical proportional counters have revealed difficulties concerned with the shape of the ionization volume and with ion diffusion. The type of counter tested owes its shape to the electrostatic field distribution. To avoid these difficulties, a new type of counter utilizing a mesh wall has been designed, constructed, tested and found to be satisfactory. A $\frac{1}{4}$ inch diameter model is currently being used for the measurement of an accelerator-produced, directly ionizing particle beam.

Theoretical work has been concerned with the analysis of the microscopic patterns of energy deposition with different kinds of ionizing radiations. A general solution for arbitrary collision spectra of charged particles has been substituted for the classical energy straggling theory of Landau and of Vavilov. The computer program written for this purpose derives not only straggling distributions, it also derives dose-dependent z-distributions from single event spectra.

The interplay of random factors responsible for the fluctuation of local energy deposition has been

further studied. Computational techniques based on Fourier Transforms are now being used to eliminate the influence of counter resolution, of straggling, and of cordlength variations from γ -distributions. These new methods can be applied to problems which formerly were treated by Monte Carlo-methods.

In cooperative experiments carried out with members of the Brookhaven Medical Division, a study was completed of lens opacification in the mouse following exposure to 0.43 MeV neutrons, 14 MeV neutrons and 250 kVp x-rays. Significant effects were found with doses as low as 0.11, 0.56 and 15 rad for the three types of radiation respectively. The relative biological effectiveness of neutrons of the two energies tested (compared to 250 kVp x-rays) appears to be dose dependent, with maximum demonstrable values of approximately 125 and 9 for neutrons of 0.43 and 14 MeV respectively.

Human studies include the completed lens examinations of 80 controls and 66 Marshall Islanders exposed to fallout doses of 14, 70, or 175 rad of whole-body gamma rays in 1954. Correlation of the incidence of minute discrete subcapsular opacities to exposure dose was found in the 14 individuals aged 0-5 years at exposure (compared to 22 controls of comparable age). The maximum effect was four times the control value, but no conclusions can be made prior to completion of statistical analysis.

Dose response curves have been determined for translocations following exposure of *Drosophila melanogaster* males to 0.58 MeV monoenergetic neutrons and X-rays. Neutron induced translocations increased linearly with increasing dose while X-ray induced translocations increased exponentially with increasing dose. The relative biological effectiveness varied from 1.8 at an x-ray dose of 4500 to 3.6 at an x-ray dose of 500 rad. Dose response curves are being determined for sex-linked recessive lethal mutations and dominant lethal mutations.

In cooperative experiments carried out with members of the Brookhaven Biology Division, inflorescences of *Tradescantia* were irradiated with 0.43 MeV neutrons and with 250 kVp x-rays. The stamen hairs were scored for stunting (indicating loss of reproductive integrity) and for 26 color and/or morphological changes as well as for cell number within the hair.

Survival curves were constructed for the x-ray and 0.43 MeV neutron data using various numbers of cells per hair as a criterion of survival. Data from the neutron experiment suggest that if a hair is scored as a survivor when it contains 12 or more

cells, then the theoretical target volume predicted from the data of Rossi approximates that of the interphase chromosome volume. A preliminary analysis of the data indicates a relative biological effectiveness of 11 or 0.43 MeV neutrons relative to 250 kVp x-rays when reproductive integrity is used as an end point.

During the past year, a laboratory has been set up to culture mammalian cells *in vitro*. Experiments have begun on the effect of single and fractionated doses on monolayer cultures of cells grown into a stationary phase due to overcrowding and nutrient deficiency; cells in this condition are used as a model for the cells near the necrotic areas of human tumors.

The Oxygen Enhancement Radion (O.E.R.) has been measured for the mixed neutron and gamma-ray emission of the nuclide californium-252. The O.E.R. was found to be 1.66 compared with 2.02 for gamma-rays from radium delivered at a low dose-rate. Californium may soon replace radium for implant radiotherapy in an attempt to produce more damage to hypoxic tumor cells for a given level of normal tissue damage.

Further studies have been completed on embryonic and fetal x-irradiation and on cataractogenesis in the mouse. A final study on the monkey fetal retina exposed to x-radiation has been reported.

Acknowledgments

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Statistics of Radiological Service - 1969

Last year's statistics were found to be in error and the corrected version is presented. The annual increase in the number of diagnostic examinations was found to be 31,585 examinations or 16%.

The highest percentage increase occurred in Urology and the Neurological Institute and constituted 30% and 28% respectively.

The figure for Harkness Pavilion includes 17,002 out-patient examinations done in Atchley Pavilion. The Presbyterian Hospital figure includes 41,320 emergency examinations done from 5 P.M. to 8 A.M. as well as Saturday and Sunday. The Institute of Ophthalmology was closed during most of the year and this work was carried out in Harkness Pavilion. The chest survey unit was permanently closed down in November.

A striking indication of the growth of the utilization of radiological facilities is obtained by a comparison with the work load of five years ago as given in the following table:

	<i>1965</i>	<i>1969</i>	<i>Patient Increase</i>
Babies Hospital	17,348	24,847	43%
Emergency X-ray	21,582	41,320	91%
Harkness Pavilion	37,385	45,062	21%
Neurological Institute ..	14,901	29,549	98%
Presbyterian Hospital ..	45,893	78,317	71%
TOTAL DIAGNOSTIC (X-RAY) DIVISION....	154,427	233,083	51%

The average growth rate of 10% per year is similar to that reported by other large hospitals throughout the country. Since there has been virtually no change in the number of patient bed-days or outpatient visits, this indicates that more radiologic procedures are being performed on the same number of patients. Of particular interest is the 91% increase in Emergency X-rays during this five year period, a jump from 21,582 in 1965 to 41,320 in 1969. Obviously, the squeeze on the radiological facilities continues.

STATISTICS OF RADIOLOGICAL SERVICE – 1969

DIAGNOSTIC DIVISION

	<i>1969</i>	<i>Work Units</i>	<i>1968*</i>	<i>Work Units</i>
	<i>Exams</i>		<i>Exams</i>	
Atchley/Harkness Pavilion	45,062	154,211	39,450	133,055
Babies Hospital	24,847	97,544	22,715	84,617
Ophthalmology	193	622	1,163	3,711
Presbyterian	119,637	444,372	103,065	382,097
Urology	7,780	63,087	5,976	46,557
Neurological Institute	29,549	144,916	23,114	115,790
TOTAL	227,068	904,752	195,483	765,827
Chest Survey	5,149		5,176	
Francis Delafield Hospital.....	45,556		39,749	
Harlem Hospital	112,652 (estimated)		101,647	
Cardiovascular Unit	866	11,325	777	10,137

* Corrected figures for 1968

DIAGNOSTIC ISOTOPE PROCEDURES

<i>Scanning Procedure</i>	<i>1969</i>	<i>1968*</i>
Brain (Including brain scan-N.I. 13).....	3,474	3,456
Liver	1,132	1,010
Thyroid	929	878
Lung	639	656
Others	287	121
TOTAL	6,461	6,121
Francis Delafield Hospital –		
<i>Scanning Procedure</i>		
TOTAL	370	304
<i>External Counting</i>		
RAI Uptake (including BMR-PH 3).....	1,597	1,450
Renogram	39	44
Other	5	15
TOTAL	1,641	1,509
<i>In Vitro</i>		
T ₃ Resin Uptake	4,038	3,719
Schilling Test	171	210
Other	31	24
TOTAL	4,240	3,953

* Corrected figures for 1968

ISOTOPE THERAPY

	1969	1968*
TOTAL PATIENTS	43	39
TOTAL TREATMENTS	59	47

RADIOTHERAPY

	1969	1968
TOTAL PATIENTS	1,144	1,141
TOTAL TREATMENTS	22,904	21,614

FRANCIS DELAFIELD HOSPITAL

TOTAL PATIENTS	951	1,019
TOTAL TREATMENTS	13,105	14,085

HARLEM HOSPITAL

TOTAL PATIENTS	71**	65
TOTAL TREATMENTS	656**	596

GRAND TOTAL - RADIOTHERAPY

PATIENTS	2,166
TREATMENTS	36,665

* Corrected figures for 1968

** Estimated figure for 1969

1969 Publications

Radiology

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Rehabilitation Medicine

ROBERT C. DARLING

Baruch Professor and Chairman of the Department · Director of Service

Rehabilitation Medicine, unlike most other specialties, is not concerned with any one system of the body, but rather with a concept of patient care, with a body of knowledge and techniques to promote human function and with a broad area of investigation in human adaptation. Its broad scope impinges quite properly on several other specialties but in an academic setting it can and should serve as an important stimulus toward scientific understanding of patient behavior and management and away from over-narrow approaches to single organ systems, especially in chronic disease. The past year has been significant especially in a more orderly introduction of these concepts into the medical curriculum and in an upsurge in the training program of medical rehabilitation specialists.

Dr. John A. Downey is on sabbatical leave for one year studying peripheral circulatory measurement with Dr. Robert F. Whelan at the University of Adelaide, South Australia. Dr. Stanley J. Myers joined the academic staff as Associate upon completion of his residency training. Dr. Charles Huckaba changed his status from that of Senior Research Associate to Professor of Rehabilitation Medicine. He concurrently retains a position on the Chemical Engineering Faculty but is committed to a program applying his engineering skill and experience to biological and medical problems. Dr. Cayetano C. Co joins the department as Assistant at New York State Rehabilitation Hospital.

The new medical curriculum allows for the first

time a logical, planned introduction of medical rehabilitation to the medical students. Knowledge of the specialty's concerns and practice is being given concurrently with neurology and neurological surgery. The highly successful teaching in collaboration with the Department of Pediatrics of fourth year students carried on at Blythedale Hospital is being continued and now includes third year students.

Increase in academic clinical staff along with gains in the quantity and quality of trainees has promoted greater organization of education in patient care. Dr. Paul J. Corcoran has added to the supervision and teaching in Neurological Institute; similarly Dr. Myers has carried on in Presbyterian Hospital proper.

Dr. Myers and Dr. Michael T. Carpendale of this department in collaboration with Dr. Robert E. Lovelace (Neurology), have expanded and improved the teaching of electrodiagnostic testing. Increases in staff and teaching programs at Blythedale Children's Hospital and New York State Rehabilitation Hospitals have promoted more meaningful assignments of trainees to these institutions. Harlem Hospital with its new rehabilitation ward is planned as another important rotation beginning January 1.

Dr. Corcoran after intensive study of the subject is introducing the use of immediate post-operative fitting of prostheses in collaboration with the surgeons. He is utilizing also new modular prosthetic designs for delayed but early fit. Both of these ac-

tivities promote the early convalescence of amputees and shorten hospital stays.

Dr. Huckaba is elaborating further experiments begun by Dr. Downey on the dynamics of human temperature regulation, utilizing paraplegia patients in which it is possible to dissociate the central and skin temperature stimuli. Dr. Miller is studying the liver blood flow and metabolism in response to changes in ambient temperature in the dog.

Dr. Corcoran completed with Dr. Hyman Dubo a study of the energy cost of a paraplegic walking with crutches and braces and also propelling a wheel chair. Dr. Corcoran is also continuing his interest in special design of leg braces.

Dr. Myers, in collaboration with Dr. Lovelace is developing methods for recording evoked sensory nerve potentials and in clarifying the electromyographic recordings in the paraspinal muscles. He is developing a program to study muscle blood-flow in isometric exercise by injections of radioactive zenon.

Dr. Luis Bonilla is contributing to the study of temperature regulation by implanting temperature sensors in the hypothalamus of dogs. Dr. Herbert L. Thornhill is studying the special characteristics of rehabilitation in Harlem by an orderly follow up of patients.

In late January Dr. Darling was Visiting Professor in the Rehabilitation Unit of the School of Medicine, University of Rochester, New York and in September he participated in the 1969 National Conference on Stroke sponsored in Minneapolis by the American Rehabilitation Foundation.

The major portions of the laboratory research program are made possible by the continued generosity of the anonymous donor who originally contributed funds to reconstruct the rehabilitation unit on the eighth floor of the Neurological Institute. The department has received continued support from the Rehabilitation Service Administration of the Department of Health, Education and Welfare for its training and teaching programs in this specialty.

Occupational Therapy Courses

Thirty-nine students were registered in the academic phase of the curriculum (29 B.S. degree and 10 M.S. degree); additionally, 28 were in the clinical affiliation phase. Of the 28 in affiliation, 12 completed requirements for the B.S. degree and 16 for the Certificate. All successfully passed the registration examination of the American Occupational Therapy Association.

The course sequence on the psychological aspects and psychopathology has been replaced. The first

part has been replaced by a course in group process for both juniors and masters, instructed by Mrs. Plotnick and Mr. Petrolino. The second part on psychopathology, will be reorganized in method and the instructional staff will consist of a psychiatrist-analyst and a psychiatric occupational therapist.

The Masters course on principles of occupational therapy, is being reorganized into two separate courses: principles of psychiatric occupational therapy and principles of physical occupational therapy. The summer practicums were highly successful. Part-time practicums during the fall and spring represent a new teaching format, requiring close collaboration between the clinical supervisors and the full time faculty.

The course on introduction to research was attended by selected undergraduate and graduate students of physical and occupational therapy and by staff therapists of the Presbyterian Hospital. It will go into its second year with Dr. Corcoran replacing Dr. Downey and Dr. Freudenthal replacing Dr. Mainland as the statistician.

Miss Simme Cynkin was appointed Associate in Occupational Therapy. Mrs. Adelaide Deutsch was promoted to Associate Director of Courses. Mrs. Hermine Plotnick was promoted from Instructor to Associate. Mrs. Ruth Knippenberg and Mrs. Susan Fine were appointed to the position of Instructor.

Physical Therapy Courses

The development of curricula in junior colleges for physical therapy assistants, has challenged the faculty to react to the resultant changes in the role and function of the physical therapist and to reflect those changes in the curriculum. The new assistants can help the manpower shortage and provide effective and quality care if the professional physical therapist in his basic education is prepared for his expanded role and if upon graduation he understands how his abilities and skills can be most effectively utilized in the health field.

Clinical exposure of students in being introduced almost from the start of the curriculum. The range of activities in the affiliated clinical programs is being adjusted as the student progresses in the program, and culminates in a final block of full time clinical practice for each student.

To expand experience in intermediary health facilities and in the home, plans are being made for student participation in the Home Care Programs at Harlem Hospital and at St. Luke's Hospital. Thirty-five students graduated, 15 of whom received the B.S. degree and 20 the Certificate of Proficiency in Physical Therapy. Presently there are 49 students

enrolled, i.e., 22 Certificate, 12 Juniors and 15 Seniors. Nine traineeships for student support were received from the Rehabilitation Service Administration of the Department of Health, Education and Welfare.

Miss Bernadette Hecox and Miss Judith Hogan were promoted to Instructors.

The Allied Health Improvement grant has made it possible to continue to add to the visual aids equipment and supplies, to research and laboratory teaching and to the improvement of the physical plant for more efficient utilization of space.

Miss Bernadette Hecox participated as a faculty member at five in-service education programs at the Institute of Rehabilitation Medicine and continues to serve in a liaison capacity between the academic and clinical program.

Miss Althea M. Jones served as adviser to the publications staff of the Student Newsletter. Miss Ruth Dickinson has served as representative along

with representatives of each of the physical therapy programs in the State of New York in the organization of a regional group of clinical coordinators and clinical education supervisors.

Miss Mary E. Callahan served as a member of the Accreditation Committee for the survey of educational curricula in physical therapy and the following other committees: Mary McMillan Scholarship Committee of the A.P.T.A., the Basic Education Committee of the A.P.T.A. and the Advisory Committee of the Social Rehabilitation Service of the Department of Health, Education and Welfare.

Development of the Allied Health Council under the chairmanship of Dean Robert H. E. Elliott has served well to promote understanding and converted action among the many programs of allied health education at the Medical Center. Its role will continue to grow with the growing emphasis on such education. Hopefully it may help to solve the problems of teaching space and its utilization.

1969 Publications

Rehabilitation Medicine

Downey, John A.; Miller, John M. and Darling, Robert C.

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Surgery

FREDERIC P. HERTER

Professor and Acting Chairman of the Department • Acting Director of Service

In July, Dr. George H. Humphreys II retired after 23 years of distinguished service as Valentine Mott Professor, Chairman of the Department of Surgery and Director of the Surgical Service. His long tenure was marked by a steady expansion in the size and the activities of the department. Not only did he develop one of the finest residency training programs in the world, directed towards the education of both clinical and academic surgeons, but he fostered a previously non-existent research program of broad base and importance. His scholarship, his surgical skills, his steadfast and principled leadership earned him universal respect; he departs with the fond salutations and gratitude of all those privileged to have been his students or colleagues. It is certainly a measure of the man that George Humphreys, rather than resting on his well deserved laurels, is now serving as Visiting Professor of Surgery at the National Taiwan University Medical School in Taipei, and has every intention of pursuing productively his surgical interests on his return.

Pending resolution of faculty deliberations relating to the conditions of appointment of departmental chairmen, a permanent successor to Dr. Humphreys as Valentine Mott Professor and Chairman has not been selected, and the Department of Surgery joins several other departments in coming under an acting directorship. The difficulties expected of a transitional administrative period have been minimized by the extraordinary enthusiasm and cooperation of the entire attending staff, and

this writer wishes to express his gratitude for the support he has been given in keeping the aims and activities of the department at a high level.

Staff Changes

On Dr. Humphreys' retirement in July, Dr. Frederick P. Herter was appointed Acting Chairman of the Department of Surgery and Acting Director of the Surgical Service at Presbyterian. Dr. Herter relinquished his post as Director of Surgery at Francis Delafield Hospital to assume these new duties, being replaced at Delafield by Dr. Joseph A. Buda.

There were four new additions to the staff. Dr. Gerard A. Kaiser, who had resigned in July of 1968 to assume charge of cardiovascular research at Mt. Sinai Hospital, returned in July of 1969 to the department as Associate Professor of Surgery. His appointment has significantly added to the research and clinical potential of the surgical cardiac unit. The Thoracic Service has been further strengthened by the addition of Dr. Paul Maynard Beach as Assistant Professor of Surgery. Dr. Beach has just completed his thoracic residency at Presbyterian. The Surgical Metabolism Unit likewise has been fortified by the appointment of Dr. James H. Duke as Assistant Professor of Surgery. He is now Associate Director of the Surgical Metabolism Unit, and has been active in the planning for the new Vanderbilt Clinic. On completion of his Chief Residency in Surgery, Dr. Richard Weil III was

added to the staff as Assistant Professor. Dr. Weil is now on leave of absence, spending six months on the renal transplantation service at the University of Minnesota under Dr. John Najarian; he will return in July of 1970 to take an active role in the department's transplantation program.

Teaching

A thorough re-evaluation of both undergraduate and graduate teaching programs in the Department of Surgery has been underway during the past eight months, prompted in large part by the structure of the new curriculum and to a lesser degree by the emerging interest in "continuing" education. Several exploratory seminars were held with senior students in the spring; those were extraordinarily helpful in defining areas of strength and weakness in our teaching efforts, and numerous constructive suggestions issuing from these talks have since seen formal implementation.

Increasing interest has been directed towards postgraduate education. The surgical traineeship program, under the sponsorship of the National Institutes of Health is flourishing; five residents are now involved. This program, which is directed by Dr. John M. Kinney, is designed to develop men highly trained not only in clinical surgery but in a research discipline as well.

In addition, effort is being made to improve the formal education of the house staff through an increasing number of planned teaching sessions. The weekly Surgical Conferences, under the guidance of Dr. Robert Hiatt and Dr. Frank E. Gump, are now devoted almost entirely to speakers from outside the institution, thus providing constant exposure to fresh ideas. Participation in national meetings of importance is being encouraged, and Dr. Hiatt is now exploring the re-institution of formal postgraduate courses in various aspects of surgery.

Patient Care

Statistics reveal a modest increase in the activities of the department related to patient care. The ratio between private and ward operations remains constant; the semi-private teaching service (S.U.S.) is properly recorded in the private column, but this has been a meaningful source of experience for the surgical residents. The 37 semi-private beds in Presbyterian encompassed by this teaching service have, in fact, become the joint responsibility of resident and attending surgeons, and the vast majority of the surgical procedures on this service have been performed by qualified members of the house staff with attending participation. It would appear that

the "team approach" expressed in this activity has found progressively widening acceptance by the patient population; almost certainly the future will find this philosophy obtaining to a degree in the private section as well, particularly if the ward census continues at its present marginal level.

Dr. Robert Bertsch and Dr. Duke have been instrumental in upgrading and making more efficient our Vanderbilt Clinic activities. Emergency procedures have become standardized (a vital necessity in the face of progressively increasing trauma admissions). Weekly Clinic conferences have been initiated, and greater attending participation in Clinic operations encouraged. Plans for the projected new Emergency Admitting Clinic have been finalized, and Dr. Duke is now heading a Departmental Committee charged with the development of comprehensive plans for the ambulatory care areas of the new Vanderbilt Clinic building.

A Surgical Intensive Care Unit has been a necessity for many years, but it can be reported that finally definite plans are emerging for such a Unit on 14 East. It is probable that between 8-9 beds will be made available in this area for intensive care, with adequate supporting facilities. The administration of the Unit will be the joint responsibility of the Surgical and Anesthesiology Services.

Research

Cardio-Pulmonary

The Cardiac Surgical Team, consisting of Drs. James R. Malm, Frederick O. Bowman, Jr. and Gerard A. Kaiser has collaborated with members of a number of other departments in carrying out a number of clinical and laboratory research projects. These collaborators include Drs. Brian Hoffman and Albert L. Waldo from Pharmacology, Drs. Stuart E. Sullivan and Richard W. Patterson from Anaesthesiology, and Dr. Donald Kornfeld from Psychiatry. Drs. Harry Bush, George Zorn, and Eduardo L. Parodi, as Research Associates, have supported the laboratory aspects of the work. Projects include: —

- a) A psychological evaluation of patients undergoing open heart surgery as correlated with long term clinical results.
- b) A study of the oxygen cost of breathing, conducted in the clinical research unit associated with the open heart recovery room.
- c) An evaluation of electro-physiological techniques in cardiac surgery.
- d) A study, at both laboratory and clinical levels, of the use of biological tissue valves, including hetero and homografts.

Dr. Paul H. Gerst has completed the developmental stage of a program for computerized surveillance of all patients with cardiac pacemakers implanted at the Columbia-Presbyterian Medical Center. This should greatly simplify and safeguard the follow-up on these patients.

Dr. Bashir A. Zikria, together with Dr. Jose M. Ferrer and Mr. Gordon Weston, has completed research evaluation of 246 burn fatalities incurred during the year 1967 with respect to respiratory tract injury, smoke and carbon monoxide poisoning. Dr. Zikria, in conjunction with Dr. Theodore Stanley, is likewise carrying out controlled studies of surface tension in tracheal aspirates of patients with severe illness or injury, correlating these measurements with pulmonary function studies and clinical complications.

Vascular

Drs. Ferdinand F. McAllister, Joseph A. Buda and Sheldon C. Sommers have completed an evaluation of the surgical treatment of renovascular hypertension in 62 patients.

Dr. Arthur B. Voorhees, Jr. continues his data tabulation on all patients subjected to vascular surgery in the Medical Center, and all patients seen in the Peripheral Vascular Clinic. A 26 year follow-up study of 404 adults with hepatic cirrhosis who have undergone portal-systemic shunting procedures is being readied for publication. Statistics on the surgical treatment of abdominal aortic aneurysms are being updated. All cases of vein graft

by-pass for obstructive vascular disease are being evaluated, as well as surgical methods for treating hepatic encephalopathy.

Gastrointestinal and Hepatic Physiology

Dr. Harold G. Barker, together with Dr. Charles Flood and Dr. Werner Dische, has completed a study of the effects of "Progastrone" on gastric mucous secretion. Dr. Robert B. Hiatt, in collaboration with Drs. Irving Goodman and Norbert I. A. Overweg, has worked out the precise pharmacology of a newly discovered posterior pituitary peptide (bovine) having an important role in the control of intestinal motility. The vasopressor and oxytoxic properties of this compound are being investigated as well as its gastrointestinal effects. The peptide is now receiving clinical trial (13 patients with a variety of intestinal motility disorders have been studied thus far), with encouraging preliminary results. Dr. Overweg, with Dr. Hiatt, Dr. L. Triner and Dr. Gabriel Nahas, is investigating basic mechanisms in the regulation of smooth muscle tone and contractility, particularly with respect to the role of Cyclic 3' 5' - AMP. Work began on the rat uterus but is now being expanded to include gastrointestinal and vascular smooth muscle.

Dr. John B. Price, Jr., with co-workers Drs. Masashi Sawada, Kotohito Takeshige, and Voorhees, has several studies underway in the Blakemore Laboratory dealing with hepatic physiology. He is attempting to define the role of portal blood substances in hepatic maintenance and regeneration.

PRESBYTERIAN HOSPITAL

OPERATIONS	1967		1968		1969	
	Priv.	Ward	Priv.	Ward	Priv.	Ward
Gastrointestinal	460	238	429	258	361	287
Gallbladder, Pancreas	315	160	284	185	253	192
Appendix	51	78	53	95	51	97
Rectal	213	49	201	55	216	56
Hernia	416	140	369	185	381	174
Breast	462	182	411	181	515	185
Thyroid	162	46	157	59	146	47
Head and Neck.....	235	32	197	20	158	45
Other Abdominal	139	80	180	130	115	178
Miscellaneous, including Vascular.....	442	164	397	205	435	162
TOTAL GENERAL	2,895	1,169	2,678	1,373	2,631	1,423
THORACIC	341	226	409	241	507	220
PLASTIC	512	411	566	381	464	478
PEDIATRIC	348	409	290	416	348	351
Subtotal	4,096	2,215	3,943	2,411	3,950	2,472
GRAND TOTAL	6,311		6,354		6,422	
Per cent	65%		62%		62%	
	35%		38%		38%	

Dr. Price is continuing research on heterotopic auxillary allogeneic transplantation of the whole canine liver; the effects of portal caval shunting, bile duct ligation and partial hepatic resection are being compared with respect to allogeneic interliver competition.

Dr. Edmund N. Goodman is resuming his studies of upper gastrointestinal physiology, using a newly modified technique of electrogastrography. His attention is directed at the precise function of the esophagogastric junction.

Dr. Thomas V. Santulli, with the collaboration of Dr. Theodore Stanley of the Department of Anaesthesia and Dr. Chiou-Chiang Chen, a Surgical Fellow, has completed a project on fecal incontinence in sheep, using a prosthetic substitute for the external sphincter. With Dr. Katherine Sprunt, he has been assessing the role of normal intestinal bacterial flora in the defense mechanism against infection. Dr. Santulli and Dr. Chen have been exploring the use of a proximal "chimney type" intestinal anastomosis, and the usefulness of techniques of transanastomotic feeding by catheter is being evaluated in rabbits for possible use in infants.

Metabolism

The surgical metabolism program, under the direction of Dr. John Kinney, includes the Clinical Unit headed by Dr. Duke, the supporting laboratories and diet kitchen, headed by Dr. Calvin L. Long, and a bioengineering group, headed by Mr. John Broell with the assistance of Dr. Edward F. Leonard (Chemical Engineering). The program includes various projects related to the general theme of energy exchange in the critically ill or injured patient. Computer solutions to mathematical models have been employed by Dr. Long and Dr. Spencer, of the Chemical Engineering Department, to study glucose metabolism and by Dr. Duke with Dr. Sten B. Jorgensen of the Department of Chemical Engineering to study amino acid metabolism. Dr. Frank Gump and Dr. John B. Price utilized hepatic vein catheterization of febrile surgical patients to determine the contribution of blood flow and O₂ uptake in the splanchnic bed to the increases in these values seen for the whole body in the presence of fever. Dr. Gump studied a group of patients with the double indicator technique to estimate extra-vascular lung water in patients with excess body water as determined by actual measurement of daily water balance. Extensive data on a group of approximately thirty patients with various degrees of sepsis or injury, has been stored on magnetic discs for subsequent computer retrieval and

analysis. This program was the first of seven centers in the country, funded by the National Institutes of Health for research in human trauma.

Dr. David V. Habif, in conjunction with Drs. Paul Killian, Andrew G. Frantz, Mohammed Parsa, Gabriel G. Nahas and Miss Rita Lipton, is studying the metabolic response to intravenous Proteolyson and high carbohydrate ("Hyperalimentation") in man. With Drs. Elias G. Deggas and Lugo Triner, this group is investigating the use of fluid gelatins in the treatment of hemorrhagic shock, and with Dr. Triner, Miss Mariagues Verosky and Miss Iris W. Schwartz, the suitability of fluorocarbon emulsions as a replacement for erythrocytes in the perfusion of isolated organs.

Dr. Charles L. Fox, Jr. and Dr. Harold D. Harvey are continuing a study of water and electrolyte metabolism in surgical patients during the post-operative period; this program was initiated at Delafield Hospital last year and is now being pursued at St. Luke's Hospital.

Cancer

Dr. Carl R. Feind, together with Drs. Edgar M. Housepian and George A. Hyman, has been investigating the use of intraarterially administered chemotherapy in combination with radiotherapy in the treatment of glioblastomas. With Dr. Joseph McCarthy, a survey of patients with primary tumors of the skull with respect to classification, treatment and prognosis is being undertaken by Dr. Feind. Regional perfusion as a means of administering chemotherapeutic agents to isolated areas of the body in high concentration continues to be utilized under limited circumstances by Dr. Frederic P. Herter. Dr. Herter continues the work initiated by the late Dr. Richard L. White on measurements of tumor activity using continuous p32 monitoring techniques.

Dr. Charles W. Findlay, Jr. is evaluating the Nordenstrom technique of percutaneous lung biopsy; in addition, he is assessing the usefulness of esophageal biopsy using an abrading catheter technique. Dr. Findlay is reviewing a group of cases of carcinoma of the esophagus which have received fractional radiotherapy (less than 3000 r). Dr. Kenneth A. Forde, in collaboration with Dr. Harold P. Freeman of Harlem Hospital and Dr. Carlo Grossi of St. Vincent's Hospital, is studying the use of intraluminal chemotherapy (5 Fluorouracil) as an adjuvant to the surgical treatment of colon carcinoma. Dr. David M. C. Ju, together with Drs. Chu H. Chang and George Hyman, is conducting a clinical study in the use of combined chemotherapy and

radiotherapy in the treatment of recurrent malignant melanoma. Dr. Ju is completing a study of the relationship between radiotherapy to the head and neck area and the subsequent appearance of salivary gland tumors.

Dr. Paul Lo Gerfo is carrying out a number of projects related to cancer in Dr. Herter's laboratory in Delafield Hospital. In conjunction with Dr. Elliott F. Osserman, he is studying the effects of various anesthetic agents on lymphocyte response. Based on the observation that pertussis vaccine produces release of phosphorus 32 from tumor tissue in rats consistent with inhibition or aggression of tumor clinically, Dr. Lo Gerfo is carrying out a more precise experiment on the effect of pertussis vaccine in preventing hepatic metastasis in rats after portal injection of Walker's 256 carcinoma cells. Dr. Duncan L. McCollester, also in the surgical research laboratories at Delafield Hospital, is studying the immunogenicity of isolated surface membrane tumor specific transplantation antigens with respect to the physical state of the membranes.

In the C. D. Haagensen laboratory in surgical pathology, Drs. Gordon I. Kaye, Nathan Lane and Robert Pascal continue their collaborative investigations of epithelio-mesenchymal interactions in the replication of normal and neoplastic colonic epithelia. Dr. Richard N. Snyder completed his study on the maturation of metastasis from testicular teratocarcinoma. Dr. Joseph Tomasulo is completing a clinico-pathological analysis of a large series of gastric polyps and their possible role of precursors of gastric cancer. Dr. Karl H. Perzin has completed a clinico-pathologic study of muco-epidermoid carcinoma in collaboration with Dr. William V. Healey. Dr. Marianne Wolff is initiating an investigation of the ultrastructure of mesenchymal tumors. In collaboration with Dr. Robert DeRossi, Dr. Raffaele Lattes is studying the natural history of a group of soft tissue tumors of histiocytic origin in the hope of establishing reliable prognostic criteria based on histologic features.

Dr. Charles A. Slanetz, Jr., in collaboration with Dr. Robert S. Grinnell, Dr. Robert D. Gongaware and Dr. Herter, has completed a clinical study of 536 alternative abdominal perineal and anterior resections in the management of low line retrosigmoid cancers.

Drs. Gongaware and Slanetz have reviewed all Hartmann resections performed at the Columbia-Presbyterian Medical Center since 1925. Within the next year, Dr. Slanetz will have completed a 50-year study of malignancy of the large intestine; this

study should include over 5000 cases from the Medical Center files from 1916 to 1969.

Dr. Cushman D. Haagensen and Dr. Sven J. Kister are conducting a number of clinical research projects related to breast carcinoma. Dr. Kister, in conjunction with Drs. Habif and Hyman, is employing quintuple chemotherapy under strict protocol in the management of advanced breast carcinoma.

Transplantation and Organ Preservation

Dr. Buda reports a gradually expanding program in the dialysis transplantation unit at the Francis Delafield Hospital. During the past year, some 200 hemodialyses have been performed on 12 patients with chronic renal disease. Dr. Buda has successfully organized a multidisciplinary transplantation team, consisting of Dr. Richard Weil III, Dr. John B. Price, Dr. Conrad Lattes and Dr. Robert Hoehn from the Department of Surgery; Dr. Elliott Osserman from Pathology; Dr. John Grant from Urology; and Dr. J. Meltzer, Dr. John H. Laragh and Dr. Paul Cannon from the Department of Medicine. In November 1969, the Medical Center's first renal transplant was carried out successfully at Delafield, and mechanisms were clarified for the future expansion of transplantation activities. Under a generous grant from the Thayer Lindsley Foundation, Dr. Buda and Dr. Edward Leonard from the School of Bioengineering have collaborated in establishing a laboratory for the study of organ preservation at Delafield Hospital. Dr. Grant (Urology) is likewise involved in this project.

Dr. Price has spent the better part of the last two years working on problems related to liver transplantation. The cardiac surgical team, headed by Dr. James R. Malm, is likewise prepared to enter the field of cardiac transplantation within the coming months.

In the transplantation biology laboratory, Dr. Hoehn, together with Dr. George F. Crikelair, Barbara Binkert and Barry Farber, has completed a number of research projects. Using a mouse screening system and the standardized techniques of Billingham and Medawar, various immunosuppressive regimens have been evaluated. With Drs. Irving Goodman and Richard Albanese, Dr. Hoehn has been studying various metabolic inhibitors as potential immunosuppressive agents. Using tissue cultured techniques, Dr. Hoehn is continuing his investigation of the effects of anti-lymphocyte sera on sensitized lymphocytes. Dr. Donald Bachman is working with Dr. Hoehn on perfecting microvascular surgical techniques for use in rat renal allografting.

Cell Physiology and Bacteriology

Dr. Margaret R. Murray, with co-workers Drs. E. B. Masurovsky, and Research Associates H. H. Benitez and C. Fildes, as well as a number of post-doctoral fellows and collaborating staffs from other institutions and departments, reports a number of developments from the Laboratory for Cell Physiology. The major areas of disease-oriented basic research have been 1) Parkinsonism, 2) demyelinating diseases, 3) muscular dystrophy and 4) leprosy. Light microscope observations by Dr. Giorgio Veneroni on de novo formation of neuromyal junctions in culture are being extended to fine-structural and functional aspects of these new-formed connections, the latter work being done by Dr. Miroslav Tolar. An inquiry into the "special affinity" of M. Leprae for components of the peripheral sensory nerves is being conducted by Dr. C. Fildes.

Dr. Charles W. Findlay, Jr., in the Meleney Laboratory of Surgical Bacteriology, is completing a four year study of oxacillin - resistant staphylococci from the general surgical service.

Plastic Surgery

Dr. George F. Crikelair, Director of the Plastic Surgery Section, has completed a number of clinical research investigations. With Dr. Bard Cosman, a study on night time operations in burned patients has been completed, as well as a study of the midline branchiogenic syndrome. With Drs. Paul S. Striker and Bard Cosman, Dr. Crikelair has completed an evaluation of surgery for submucous cleft palate, and with Drs. John L. Krause, and Cosman, an evaluation of Cronin implants in combined breast and chest wall deformities. With Dr. Hoehn, Dr. Crikelair has reported on the use of human allograft skin in epidermyolysis bullosa. He has also continued his interest, in conjunction with Drs. Frederic J. Agate (Anatomy) and Ronald N. Ollstein, in burn and flame retardant clothing. Dr. Cosman, together with Dr. Howard T. Bellin, has reported on a new congenital ear deformity.

Dr. Francis C. Symonds, in collaboration with Drs. Crikelair, Ollstein and Miss June Traver, has completed a clinical review of 125 cases of sulfamylon treated burn cases. He has also presented a report on electrical burns of the lip and on penetrating wounds of the forearm. Dr. Symonds is now studying, with these same co-workers, temperature in flame burns, and with Dr. Charles L. Fox, Jr., the use of topical silver sulfadiazine in burns. With Dr. J. Thorne, he is reviewing the subject of wrist ganglions, and with Dr. Arthur Garnes, the use of tendon transfers for ulnar nerve palsy.

Dr. Charles L. Fox, Jr., with co-worker Dr. Angus Sampath, continues his laboratory and clinical investigation of silver sulfadiazine which was developed in his own laboratory.

Wound Healing

Dr. John F. Prudden, with co-workers Dr. Evan R. Wolarsky and Mr. Peter Migel, have made considerable research progress during this past year by succeeding in identifying two pure chemical substances capable of accelerating the healing of wounds.

Other Clinical Studies

Dr. Carl R. Feind, in collaboration with Dr. Sidney Werner (Medicine), has completed a study of the classification of thyroid disease. With Dr. Henry C. Aranow, Dr. Feind is completing work on the so-called thyroid nodule project, consisting of random selection of the treatment of thyroid nodules by either surgery or suppressive medical replacement. A study on the autogenous transplantation of both normal and hyperplastic parathyroid glands has been undertaken by Dr. Feind.

Dr. John Scudder is carrying out an extensive review of the occurrence of hepatitis following blood transfusion in the Presbyterian Hospital.

Bassett

The most major development of 1969 was the nearing of completion of a new in-patient building. There were 736 major operations and 2,274 minor operations performed during the year. Sixty-five percent of the major operations were performed by the intern and resident staff. There were 13,181 surgical out-patient visits and 5,146 surgical patients seen in the emergency area.

During the year 19 students from the College of Physicians and Surgeons served clinical clerkships at the Bassett Hospital. As part of the new elective system for Columbia students, one student received training on several services for a period of six months. In addition to the clinical clerkship in general surgery, various other elective programs will be offered in 1970.

Research programs involving orthotopic allotransplantation of the heart and the lung have been continued in dogs selected by histocompatibility typing. Dr. David A. Blumenstock completed a collaborative study of pulmonary function in long-term surviving dogs subjected to bilateral reimplantation or unilateral allotransplantation of the lung with Dr. Homayoun Kazemi, of the Massachusetts General Hospital. Dr. Thomas P. Ashford has ini-

tiated a combined experimental and clinical study of postoperative venous thrombosis comparing the accuracy of diagnosis of clinical evaluation, isotope labeled fibrinogen and bidirectional Doppler determinations. Dr. Ashford is also collaborating in a study of ultrastructure of meningococcal L forms with Dr. Malcolm Page (Medicine). Dr. John E. Olson has initiated a study of metabolic changes in aged surgical patients. These studies will be continued and expanded in the intensive care unit of the new hospital building.

During the year, Dr. William Silen, Professor of Surgery, at the Harvard Medical School, and Chief-of-Surgery, of the Beth Israel Hospital, Boston, served as visiting professor pro-tem and provided a stimulating experience for the house staff and attending surgeons.

Delafield

In July 1969, Dr. Joseph A. Buda became Director of the Surgical Service at the Francis Delafield Hospital, replacing Dr. Frederic P. Herter. With the changing of the character of patients' problems to include those other than cancer, surgical activities increased to a degree. In 1969, there were 5,735 surgical out-patient visits, 969 admissions, 624 operations and 94 endoscopies. This represents a 20% increase from the previous year. One hundred and seventy-one deaths were recorded on the Surgical Service, with 73 autopsies.

The dialysis and transplantation facilities at Delafield were improved considerably during 1969. The

number of hemodialysis units was increased to three, and there are current plans for the installation of an additional unit. On November 15, 1969, the first Medical Center transplant took place at Delafield. The forthcoming year should see a further expansion in the facilities and activities of the dialysis-transplantation unit. There are additional plans for modernization of the recovery room facilities and for a new intensive care unit, pending adequate funding by the City.

Dr. Paul Lo Gerfo continues to work in Dr. Herter's laboratory on varied problems related to cancer.

Fourth year medical students have continued to serve regularly as sub-interns on the Surgical Service. The American Cancer Society sponsored third year course in cancer has remained operational on the Surgical Service.

Harlem

1969 was the singular year in the history of Harlem Hospital. On September 6, 1969, the official move was made to the long-awaited new hospital. The work schedule necessarily suffered some interruptions from the move to the new hospital, and the yearly statistics reveal a modest decrease in the number of surgical operations performed; out-patient visits, however, increased slightly.

The Harlem Hospital Center has been approved as an Amputee Center by the State of New York. A new Amputee Clinic, under the direction of Dr. Herbert Thornhill, Dr. Marvin L. Shelton and Dr.

PATIENT STATISTICS

<i>Service</i>	<i>Admissions</i>	<i>Operations</i>	<i>Deaths</i>	<i>O.P.D. Visits</i>
Plastic Surgery	328	347	11	3,108
Oral Surgery	72	28	0	7,086
Vascular Surgery	139	89	10	1,653
Otolaryngology	271	252	1	5,721
Urology	394	161	5	2,746
Pediatric Surgery	213	117	2	1,823
Neurosurgery	892	98	47	471
Thoracic Surgery	214	126	20	478
Orthopedic Surgery	643	512	12	8,060
General Surgery - A	682	450	51	
General Surgery - B	768	436	32	11,474
Total Admissions			4,616	
Transfers In			1,478	
Total Surgical Admissions			6,094	
Total Surgical Operations			2,616	
Total Surgical Deaths			191	
Total O.P.D. Visits.....			42,620	
Total Emergency Room Visits.....			37,619	

Arthur Voorhees, has been established jointly by the Department of Rehabilitation Medicine and the Sections of Orthopedic and Vascular Surgery. A new Breast Clinic has been established under the direction of Dr. Philip Wiedel, and a Maxillo-Facial Service has been established under the joint auspices of Dr. Lowyd W. Ballantyne of Plastic Surgery and Dr. Arthur C. Williams of Oral Surgery.

Several research projects are underway. Dr. Adrian Lambert continues his investigations of enzyme mechanisms in tumor tissues. Drs. Ferrer and Zikria continue their study of respiratory burns and smoke poisoning in the New York metropolitan area. Drs. Ferrer, Forde, Avtar Josen and Zikria are carrying out a study of traumatic wounds of the large bowel, and Dr. Mohammad Parsa pursues his very interesting studies of hyper-alimentation (central venous feeding) in pancreatitis and malnutrition. Dr. Frederick R. Randall is initiating the study of vitamin A absorption in pancreatitis, and Dr. Harold Garnes is investigating blood and prostatic levels of Vibramycin. Dr. Theodore Stanley and Dr. Zikria are continuing a study of surface tension activity in the lungs and tracheobronchial tree, and in conjunction with Dr. Carlo E. Grossi (St. Vincent's Hospital), Drs. Forde and Freeman are studying adjuvant intraluminal chemotherapy in the treatment of colorectal carcinoma. Dr. Marvin L. Shelton (Orthopedic Surgery) is studying, in a controlled manner, various methods of management of fractures of the tibia and fibula in adults.

Roosevelt

Under the directorship of Dr. Walter A. Wichern, Jr., the Surgical Service at Roosevelt enlarged its teaching and research potential by the addition of several new members during the past year.

Seven thousand one hundred and seventy-two operations were performed by the surgical staff during the past year, a slight increase over the previous year. Thirty-five percent of these cases were performed by the house staff. Twenty out-patient clinics received visits from 18,178 patients, and the Emergency Room treated approximately 175 patients each day.

Fifty-seven medical students from the College of Physicians and Surgeons chose their surgical elective at Roosevelt where they performed in the capacity of sub-interns. The quality of this teaching experience at Roosevelt has remained at high level.

A resurging interest in clinical and laboratory research has evidenced itself. Dr. Howard Dunbar has extended his studies on the physiology of spinal fluid. Dr. Paul D. Harris has initiated an investiga-

tion of blood vessel preservation. The physiologic effects of reversing intestinal segments after massive small bowel resection is being evaluated by Dr. Cedric Priebe, and Dr. Alexander is working on the metabolic effects of total gastrectomy. Dr. William V. Healey is continuing his work on cryo-surgical techniques and the metabolic consequences of freezing specific volumes of liver tissue.

St. Luke's

Dr. Harold A. Zintel resigned as Director of Surgery to accept a position with the American College of Surgeons. He was replaced by Dr. John P. West as Acting Director. Dr. John J. White was a new addition to the staff.

The clinical and teaching activities of the department remained essentially unchanged over the previous year. 4,000 surgical operations were performed during the past year.

Twenty-two fourth year medical students from the College of Physicians and Surgeons served as sub-interns. The number of emergency room visits increased by about 5,000 during the past year, with a significant upturn in the number of patients being treated for major trauma. As a consequence, work is beginning on the enlargement and renovation of the emergency room facilities. A Hemodialysis Unit was established in 1969 by the Medical Department; its geographic location on a surgical floor will facilitate the development of a renal transplant program, projected to begin in 1970.

The Surgical Experimental Laboratories, under the directorship of Dr. Colin McCord, have remained extremely active. Dr. McCord, Mr. Leonard Friedman and Professor Edward Leonard (Columbia-Bioengineering) are collaborating on electron microscopic study of the initial deposit on vascular grafts. Dr. McCord and Mr. Inayat Lalani are developing an animal model for the study of the transplanted lung. The metabolic defects of the anoxic heart are being investigated by Dr. McCord and Dr. Robert Case. Dr. Robert McCabe is carrying out renal transplantation experiments in animals using a technique of hypothermic perfusion of the isolated organs. Dr. Merritt Hait is studying the use of microcrystalline collagen as a hemostatic agent, and Dr. Richard Stark and Dr. Hiroshi Washio are investigating the vascular enhancement of abdominal skin using segments of small intestine.

Elections and Honors

Dr. John M. Kinney was appointed Chairman of the Shock Committee of the National Research Council, and selected as Editor of the 2nd Edition

of the Pre and Postoperative Care Manual of the American College of Surgeons. In addition, Dr. Kinney was reappointed as Consultant to the Surgeon General on problems relating to the metabolism of injury, and to the NIH Advisory Committee on Surgical Training Grants.

Dr. David V. Habif has been serving during the past year as a member of the American Board of Surgery and as President of the Allen O. Whipple Surgical Society. Dr. James R. Malm was elected a member of the Board of Thoracic Surgery, and a member of the Cardiovascular Council of The American Heart Association. Dr. Gerard A. Kaiser was elected to Fellowship in the American College of Surgeons, and to the New York Society for Thoracic Surgery; in addition, he was awarded an Established Investigatorship from the American Heart Association for a period of five years. Dr. Frederick O. Bowman, Jr., was elected to the Society of Thoracic Surgeons and The American Society for Thoracic Surgery.

The New York City Division of the American Cancer Society named Dr. Frederic P. Herter and Dr. Kenneth A. Forde to its Board of Directors. Dr. Herter was elected to the Harvey Society and the Society of Surgical Chairmen; he served as Chairman of the Surgical Section of the New York State Medical Society, and he served as Chairman of the Program Committee of the New York Cancer Society, and local chairman for the July meeting of the Society for Surgery of the Alimentary tract. Dr. John B. Price, Jr., was elected to the Harvey Society and the American Gastroenterological Association. Dr. Thomas V. Santulli was appointed to the editorial board of the *Journal of Pediatric Surgery*.

Dr. George F. Crikelair was named a Founder Member of the American Burn Association and elected Vice President of the American Society of Plastic and Reconstructive Surgery. Dr. Robert B. Hiatt served as Visiting Professor at the University of Sydney, Sydney, Australia, and was elected a Corresponding Member of the Australasian Surgical Research Society.

Other Activities

On May 9, 1969, a program was presented in honor of Dr. Humphreys in which several of his past resident trainees gave papers which were subsequently discussed by present members of the Surgical Staff. A large number of surgical alumni were present, and the excellent scientific program was followed by an appropriately elaborate dinner at the Plaza for Dr. and Mrs. Humphreys. On May 26

and 27, an international Symposium on "Fluid Replacement in The Surgical Patient" was held in the College; the program was organized by Dr. Charles L. Fox, Jr. of Surgery and Dr. Gabriel G. Nahas of Anaesthesiology, and the meeting dedicated to Dr. Humphreys. Dr. David V. Habif organized an excellent meeting of the Allen O. Whipple Surgical Society at the Albany Medical College on April 18-19.

The twenty-second John G. Gibson Lecture was delivered on September 4, 1969 by Dr. Peter J. Morris of the Department of Surgery at the University of Melbourne. His subject was leukocyte typing and its role in organ transplantation.

There were numerous visitors to the department from this country and abroad. Included among these were Mr. Richard Handley of London, Sir Michael Woodruff of Edinburgh, Dr. Donald Clark from Sheffield, England, Professor Komei Nakayama, Dr. Fujio Hanyu and Dr. Nohuru Sakakibara of Tokyo Women's Medical College, Professor Masahiko Yoshioka of Nippon Medical School, Tokyo, Dr. Toshitsune Shimada of Chiba University, Dr. T. Nishihira of Sendai, Dr. Sansaku Watanabe of Yokohama City University, Dr. Alejandro Terzian of Buenos Aires, Dr. Mark Pemberton of London, Dr. Andre Wittlinger of France, Dr. Udekuw from Biafra, Dr. Stanley Dudrick, Dr. Paul S. Russell from Harvard, Dr. W. J. Kolff of the University of Utah, Dr. John Zabriskie of Rockefeller University, Dr. Robert Litwak of Mt. Sinai Hospital, Dr. Victor Parsonnet from The Newark Beth Israel Hospital, Dr. Howard Nay of St. Luke's Hospital, Dr. William F. Bauer, Dr. Frank Veith from Montefiore Hospital and Dr. Gerald Gibbons of Wenatchee, Washington.

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Urology

JOHN K. LATTIMER

Professor and Chairman of the Department • Director of Service

During 1969 the urology service not only expanded to become one of the largest urology patient care units in the world but increased the capability of its three electron microscopes to be able to magnify five million times, thus opening up a whole new world in the field of urological cancer research. Its staff members served as Presidents of the Society of University Urologists (Dr. John K. Lattimer); the American Geriatrics Society (Dr. Hans H. Zinsser); Chairman of the Medical Board of Delafield Hospital (Dr. Ralph J. Veenema); Vice-President of the Irene Heinz Given and John La Porte Given Foundation (Dr. Meyer Melicow); and admitted its 71,559th patient.

During 1968 Dr. George Fish retired from active practice but continued as a consultant and speaker at international medical meetings. Dr. John P. Grant joined the service as one of the members of the kidney transplant team now operating at the Francis Delafield Hospital. The department's prize winning time lapse motion picture, depicting cancer cells dividing at an alarming rate, judged the best scientific motion picture of the year, was repeatedly shown on television, both here and abroad, on various educational programs about cancer.

The members of the department again won a large majority of the awards of the prizes at the Residents Prize Essay Contest at the New York Academy of Medicine, sponsored by the New York Section of the American Urological Association. They won every prize in the laboratory research category.

A departmental training grant from the National Institutes of Health has seen one of its alumni, Dr. Vernon Smith, become Acting Chairman of the Department of Urology at the Medical College of Virginia; another alumnus, Dr. Robert Weiss become the number-two man on the Yale University Medical School Department of Urology and several of the other trainees looking forward to academic careers upon completion of their military obligations.

The pediatric urological service has been strengthened by the collaborative work of Dr. Gilbert Simon (Pediatrics) and Dr. William W. Garitano (Psychiatry).

Major Changes in Curriculum

Paramedical training programs were undertaken in two areas. In collaboration with the School of Nursing, a nurse-clinician program was instituted with Miss Debra Dingwall. Mrs. Katherine Jeter has instituted a training program for stoma specialists and devotes her time to improvement of this art among the residents, the nurses and visitors.

Dr. Stanford Pulrang has proved invaluable in coordinating the teaching of the third and fourth year medical students during this transition year to the new curriculum. The department's equipment and technology have been of use to the entire specialty field of urology and a nationwide survey of the capabilities of urology, both in its capacity for the delivering of patient care and its teaching and research capabilities is now being undertaken by the department, as part of this educational study.

The Irene Heinz Given and John La Porte Given Fellowships in pediatric urology have enabled the department to train pediatric urologists from not only many universities across the country but from other lands as well.

The shift of the basic urology course from the last year of medical school to the third year, along with the newly introduced correlation clinics and sessions in uropathology and physical diagnosis, have been most welcome changes. A further shift to the second year of the medical school program, in keeping with the new Columbia curriculum plan, will now be approached with enthusiasm.

Patient Care

Freezing the prostate gland (cryosurgery) has proved to be highly practical and safe for bad-risk patients. Research into better and safer ways of doing this operation continues, under The John A. Hartford Foundation grant.

When a biopsy is removed from a patient now in this department, it is grown in a test tube rather than killed and placed upon a slide. Its degree of activity, its rate of DNA and RNA synthesis and its dangerousness to the patient is studied by these tissue culture techniques. It is possible to observe the relative effectiveness of various anti-cancer drugs on any particular cancer and to differentiate between cancer cells and benign cells, in doubtful cases. These advanced methods of diagnosis have been developed and applied by Dr. Myron Tannenbaum and members of his staff, including Mrs. Jean Todd, Miss Virginia Lerch and Dr. Philip Tomashefsky.

The physiological testing unit measures flow rates and bladder pressures during voiding. A tiny radio set has been developed so that we can record vesicle pressures without any needles or wires attached.

Several new antibacterial medications of the Keflin family have been tested on the service, as well as new antituberculosis drugs such as ethambutal.

The prostate has been shrunk in many patients through the use of hormonal agents pioneered by Dr. Veenema and his staff and thiotepa has been found effective as a topical anti-cancer agent in the bladder and is especially useful in reducing the incidence of recurrent bladder tumors.

Research

A textbook entitled, *Neoplasms of the Genitourinary Tract*, is well along towards completion by Dr. Meyer M. Melicow and his staff. Dr. Melicow presented his work on tumors of the male urinary tract at Fairleigh Dickinson University and on tumors of the bladder at the Armed Forces Institute of Pa-

thology in Washington, D. C., at the seminar on the adrenal gland at the University of South Florida, and at the American Urological Association meeting in San Francisco; Dr. Melicow spoke on the evolution of urology; some famous personalities with urological disorders. Dr. Melicow also presented an exhibit on this topic at the annual meeting of the American Medical Association in New York and won a prize at the Physicians Art Association at the AMA convention as well. Dr. Melicow also presented papers on testis tumors and on advanced methods for studying Wilms' tumor and neuroblastoma at the Eleventh Urological Congress of the Americas in Miami Beach. Dr. Melicow also discussed differential diagnosis of intersex and cystic diseases of the kidney at the annual seminar of pediatric urology at the University of Miami in December.

Dr. Myron Tannenbaum has discovered virus-like particles not only in our cancers of the prostate gland but in the secretions in the lumens of these prostatic glands as well. He has also discovered similar virus-like material in cancers of the breast and in the secretions of these cancers into their own glandular structures.

Hypertension Research

Dr. Sandor Wax, of our Brookdale Hospital Center Unit, published a paper on radio-isotope uptake in experimental hydronephrosis, and Dr. David Schwartz developed a clinical assay for plasma angiotensin and angiotensinase, using enzyme kinetics in radio isotope dilution principles, for a relatively simple test. Dr. Schwartz continued his studies of portacaval transposition as a treatment for renal hypertension. Dr. Richard C. Mason, assigned to the Department of Physiology continued his functional studies of compensatory renal hypertrophy in conjunction with Dr. Stanley Bradley's group in Medicine, Dr. Walter Stingle, one of the P & S graduates of 1969, completed *in vivo* and *in-vitro* studies on the physiology of bladder muscle.

Infection Research

Dr. Seneca continued his experiments causing pyelonephritis with the lipopolysaccharides from gram negative bacteria. He completed clinical research on cephaloglycin and developed, in conjunction with Dr. Robert Fisher (Pediatric Fellow), a routine for rapid identification of drug susceptibility.

Stone Research

Dr. Zinsser and staff published a paper on a nomogram for ionized calcium in human urine, and

presented a paper on renal function and urinary ionized calcium before the American Society of Nephrology; a paper on urinary ionized calcium in urolithiasis and the effect of cranberry juice for the *Journal of the American Dietetic Association*, and as President of the American Geriatrics Society delivered papers on geriatrics and the medical school curriculum, computers in urology, advances in prostatic disease, combining sites for metabolic aging compounds on a model of elastin, unsuspected prostatic pathology discrimination and control of male fertility. Dr. Zinsser and staff continue their studies with carbon 14 labelled vitamin B₆ absorption studies and glycine nitrogen 15 uric acid kinetics in calcium oxalate stone patients, and long-term pyelonephritis study, sperm sorting techniques and has initiated a fellowship in India on fertility control, as an elective for P&S medical students.

Infertility Research

Dr. Zinsser presented his work on the control of male fertility at a symposium on family planning at Philadelphia. Dr. Moshe Markowitz demonstrated two metabolic deficiencies in testes biopsied from patients with diminished fertility.

Cryptorchid testes revealed a retardation of DNA and RNA synthesis in the undescended testis as compared to its descended mate. Studies to demonstrate the role of the epididymis in sperm formation dissolution or storage were undertaken by Dr. Markowitz in rats.

Research on Trauma

The Harlem Hospital unit, combined with the Francis Delafield residency program, has continued its study of urological trauma and papers and exhibits have been presented during the year on this topic.

Cancer Research

Dr. Tannenbaum described a new chromosome change in Wilms' tumors of the kidney and an animal model of Wilms' tumor was developed in collaboration with Dr. Jacob Furth of the Institute of Cancer Research. A time-lapse motion picture demonstrating the ability of tissue culture to differentiate difficult cases of neuroblastoma from Wilms' tumor was shown at the annual meeting of the American Urological Association meeting in San Francisco. Enlargement of the prostate was caused in rats by Dr. Fingerhut, and then various medications tested to see which might cure the condition the easiest.

A new anti-cancer drug, cyproterone acetate, was tested on the germinal epithelium of patients with

prostatic cancer, using radioautography. A study of the reliability of exfoliative cytology for cancer of the urinary tract was published in the *Journal of Urology* by Drs. Park, Uson and Veenema and a paper was published on the prophylaxis of bladder cancers with thioteipa, also in the *Journal of Urology*.

Dr. Veenema delivered papers at the Pan-Pacific Surgical Association in Hawaii on combined radiotherapy, surgery and chemotherapy in bladder cancer and moderated their panel on bladder cancer as well as participating in their symposium on the treatment of prostatic cancer in Berlin in 1969. Drs. Veenema and Fingerhut and staff won prizes for their scientific exhibit on experimental studies of benign hypertrophy of the prostate, as well as treatment of bladder cancers with thioteipa.

Studies of the chromosomes in both benign and cancerous prostate cells were initiated, to see whether the growing cancer cells showed a different type of chromosome than the growing benign cells. Cultures of human kidneys and human kidney cancers are being developed, again in order to have a highly practical and workable model.

Dr. Philip Tomashevsky has continued his analysis of the biochemical parameters of growth and metabolism in the normal prostate and also in the enlarged prostate. The rate of synthesis of sex hormones in the testes of animals whose prostates have been partially destroyed, is also being carried on.

The metabolism of prostate tissue removed from patients in the operating room is also being studied with oxygen consumption of slices, as related to the structure of the tissue, and is now being analyzed mathematically on our computer.

Dr. Peter Pucner and Mr. Jose Ortiz have studied the rate of absorption of thioteipa and the time the drug is present in each tissue as it works its way through the bladder wall.

Harlem Hospital

Dr. Harold A. Barnes and his group at Harlem Hospital are doing studies on penetrating wounds of the kidney on patients seen at Harlem Hospital since January, 1963. Similar studies are being conducted on urethral strictures. They are also doing a study comparing the concentration of vibramycin in the blood and prostatic tissue after a given amount of vibramycin has been administered.

The most exciting and interesting event of the year was the moving into the new centrally air conditioned hospital. Urology was allotted twenty-four beds with every modern convenience for patient care. There is an operating room assigned to the

Urology Services and two cystoscopy rooms, one of which is equipped with cine fluoroscopy. The new facilities will enhance patient care and better training for the residents.

Donors

We are very grateful to all of the donors who have contributed to the support of the work of the department. They are Dr. Luis Marte Abreu, Malcolm P. Aldrich, Jack Alpern, Elmore L. Andrews, Alex H. Ardrey, Mr. & Mrs. Marcel Armand, Myron S. Auerbach, Mrs. Rose Avellino, Ayerst Laboratories, Barnett & Weitzner, Inc., Louis Berkowitz, Allen Bixen, Albert Blackton, Augustin Blanco, Mrs. Dorothy R. Bleecker, Mrs. Evelyn Brogren, Mr. & Mrs. William Byrne, The George F. Cahill Fund, Dr. Thomas G. Carr, H. Benjamin Carroll, Morris Chernofsky, Mrs. Jay I. Chernow, Michael Chernow (The Chernow Fund), The Commonwealth Fund, Friends of Sharon Copland, James N. Cost, Mr. & Mrs. Robert Covin, Alfred D'Arco, Theodore S. Darrah, Mrs. John E. Dempsey, Mrs. Jean B. Denison, Dr. Peter N. DeSanctis, Louis Diamond, Bertha Dillon - Susan Douglass Foundation, Inc., Clarence Dillon, Dr. Louis J. Dougherty, Lewis W. Douglas (Pantano Foundation), Mrs. Sidney Dreier, Alfred H. Drewes Memorial Fund, Eaton Laboratories, Abraham Eletz, Miss Betty Elsas, J. R. Elyashar, Dr. Richard Fadil, Lawrence W. Fagel, Mr. & Mrs. Richard Fishman, Fred Fredericks, Mr. & Mrs. Max Freedman, Ernest H. Froebel, Dr. Clement A. Furey, Norman Gatof, Irene Heinz & John La Porte Given Foundation, Inc., Murray Glaser, Harry Goldman, William H. Goldsmith, Oscar Goldstein, Mr. & Mrs. Nicholas P. Goulandris, Dr. Roberto Granato, Mr. & Mrs. Herbert Greenbaum, Mrs. Sadie B. Greenwald, Jos. & Caroline Gruss Charitable Foundation, Inc., George H. Haley, The John A. Hartford Foundation, Inc., Joseph Heiferman, Noel Henneberry, Mrs. Marion Hensel, Henry F. Herlitz, Jerome S. Hess, Hoffmann-La Roche Inc., Mr. & Mrs. Jac Hohenstein, Peter S. Ingoglia, Theodore S. Jaffin, Mrs. Johanna C. C. Johnson, Mrs. Mary Jonas, Bruno Joseph, Kahn-Markowitz Foundation, William F. Kann (The Kann Foundation), Samuel Kaplon, Mr. & Mrs. Barney Kava, Chester B. Keating, Dr. David E. Knoop, Henry Kohn (The Ed Lee & Jean Campe Foundation), Miss Ida Koppel, Mr. & Mrs. Donald Kramer, Martin Krasner, Albert Krassner, Dr. & Mrs. John K. Lattimer, Mr. & Mrs. Edgar Lehman, Dr. Sidney Leistner, Miss Helen Lemberg, Douglas Levin, Miss Mary Levine, Dr. Morris Levy, Samuel Levy, Joseph Lieber,

Mr. & Mrs. Joseph Liebernick, Eli Lilly & Co., Manice DeForest Lockwood, Dr. Frank W. Longo, Mr. & Mrs. Jerome Low, Mrs. Mildred Lubin, Miss Clara Maier, Mr. & Mrs. Dick Manning, Mr. & Mrs. Mitchell Manning, Dr. Moshe Markowitz, Mrs. Jean Markowitz, Dr. Ferdinand F. McAllister, Clarence F. McCarthy, Mrs. Thomas McGrath, Mr. & Mrs. William Meister, A. Archie Meyers, Leo Model, Employees of Monocraft Products Co., Barrett Montfort Foundation, Morris & Celia Morgenstern Foundation, Mrs. John Bromley Moses, Nat Nadel, National Heart Institute, National Institutes of Health, National Institute of Arthritis & Metabolic Diseases, Samuel Neuburger, Ocean Spray Cranberries, Inc., Miss Zella F. O'Connell, Jerome Oppenheimer, Mr. & Mrs. Richard Osk, Miss Tanya C. Ostrove, C. J. Pallesen, Jr., Mrs. Elsie B. Papazian, C. Michael Paul (Charles Ulrich & Josephine Bay Foundation, Inc.), Dr. Harry L. Pelham, Fred & Gertrude Perlberg Foundation, Inc., Benjamin Perlman, Joseph & Grace Perlman Foundation, Dr. Joshua M. Perman, Mrs. Fernand Pisart, Spelman Prentice, Arthur Printz, Mrs. Edith Printz, Mrs. Bess Aspinwall Pulitzer, Norman Rabinowicz, Mrs. Martin Ransohoff, J. Squier Reimer, Otto B. Reimer Reinhold Bros., Benjamin W. Rice, H. Smith Richardson (Smith Richardson Foundation Inc.), Dr. Myron S. Roberts, Dr. John N. Robinson Memorial Fund, Mrs. John N. Robinson (The Widgeon Foundation), Mrs. Edith Rosen, I. W. Rosenberg, Murry M. Rothenberg, Randy Rothman, Mr. & Mrs. Allen Salovin, Victor Saxon, Michael Schein, Miss Josephine Schoorl, Arnold Schwartz (Brookdale Foundation), F. A. O. Schwarz, Richard B. Scudder, G. D. Searle & Co., Mr. & Mrs. Larry Segal, Herman D. Segal, Alex Silberstein, Marvin Silverman, Walter H. Simson, Mr. & Mrs. Joseph Small, Malcolm Smith, Jack Spain, Jr., Mrs. Shirley M. Speiller, Mrs. Ina Steinberg, John Frederick Steinman Foundation, Sape T. Stheeman, Leonard Stone, Friends of Bernard Stoppick, Mr. & Mrs. Edward Streim, Friends of Dr. Thomas J. Sullivan, Joel Sussman, Dr. Moses Swick, Charles G. Taylor, Dale K. Tuller, U. S. Dept. of Health Education & Welfare (Public Health Service), Dr. Aurelio C. Uson, Mrs. R. P. Van Anda, Dr. Ralph J. Veenema, Edwin C. and Florence G. Vogel Fund, Inc., Lowell Wadmond, DeWitt Wallace (The Lakeview Fund), Miss Charlotte Wank, Sidney Weinberg, Irving Weinstein, Zelda Radow Weintraub Cancer Fund, Inc., Wellington Foundation, Inc., Mrs. Eleanor A. Whitaker, William E. Wiegand and Isidore Ziebrowsky.

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International Institute for the Study of Human Reproduction

HOWARD C. TAYLOR, JR., *Director*

The Institute's development in 1969 was a steady, if unspectacular one, retarded as heretofore by a lack of available space. Expansion has been most evident in the areas where laboratory facilities were not necessary, that is to say, in the public health and social aspects of the field, slower in the areas of biology and biochemistry where limitation in available technical facilities has placed a fairly inflexible limit on growth.

From the initiation of the Institute's program, the aim has been to achieve the finest possible facilities for research in the belief that only with these could the best talent be recruited to a field in which such talent seems particularly needed. On the basis of this policy, primary consideration has been given to the acquisition of land, the planning of the building and the securing of "matching funds" from the National Institutes of Health, to complete the sum needed for construction. The architectural plans are nearly completed and could be ready for bids soon after the beginning of the new year. Up until now, however, Congress has not appropriated the money to fund the grant to the Institute which had been formally approved by the National Institutes of Health for half the costs of construction. This failure threatens a serious setback in the Institute's timetable.

The Institute has continued to operate with the four divisions referred to in last year's report and has added a fifth one concerned with the application

of morphological techniques to research in human reproduction. A unit concerned with Family Planning Services and the research associated with these is being developed in collaboration with the Department of Obstetrics and Gynecology and will begin to function actively on January 1, 1970. A brief description of the work of the various divisions follows:

Reproductive Biochemistry

The program of Dr. Seymour Lieberman (Biochemistry) and his associates devoted to the many dynamic aspects of steroid endocrine biochemistry has continued to spread into new fields as the subject itself has grown. Present studies have been concerned with the conversion of certain steroid compounds into others, with the dynamics and uptake of steroids by target tissues with nature and activity of various receptor macromolecules, and with the development of tritium labelled polypeptide hormones to be used in the study of many of the complex reactions in which steroids are involved.

Dr. Kenneth Roberts (Biochemistry) has investigated the conversion of cholesterol into pregnenolone, and has been trying to demonstrate that the side-chain cleavage of cholesterol is mediated through mechanisms similar to those characteristic of free radicals. Dr. Richard Hochberg has worked on the conversions of cholesterol and cholesterol sulfate into free and sulfated steroids by adrena-

mitochondria and with Mr. Theodore vande Hoeven, a graduate student, has been trying to partition adrenal mitochondria into classes according to their capacity to use cholesterol or its sulfate as precursors for the steroid hormones.

Dr. Erlio Gurgide (Biochemistry), with Dr. Linda Tseng (Biochemistry) and Miss Margaret Welch, utilizing *in vitro* experiments involving the constant low perfusion of slices of human tissues with media containing a mixture of tracers of estrogens and androgens, are studying the uptake of estrogens and androgens and determining the fraction of a profused tracer that enters and leaves cells. Dr. Paula Zimmering (Biochemistry) has continued her studies on the purification and properties of the uterine receptor macromolecules with particular emphasis on their binding characteristics to 17-beta-estradiol and progesterone. Using inverse flow chromatography on dextran gels, she has separated the endometrial cytoplasmic fraction of sheep uteri into two estrogen-binding fractions. These fractions of different size and binding property are now being individually studied.

Dr. Wylie Hembree (Biochemistry), working with Dr. Alfred P. Wolf (Department of Chemistry at the Brookhaven National Laboratories), and with Dr. Zimming, is endeavoring to find a technique for tritium labelling of polypeptide hormones. Adrenocorticotrophic hormone (ACTH) has been chosen as the model polypeptide hormone for this method with the objective of studying the biological and immunological characteristics of the labeled hormone. As a result antibodies to ACTH have been obtained from rabbits and a sensitive radio-ligand assay for plasma corticosterone in rats has been developed.

Division of Clinical Investigation

In his own unit, Dr. Raymond Vande Wiele (Obstetrics and Gynecology) and his associates have continued their studies of the human menstrual cycle in many of its aspects. A mathematical model of the human menstrual cycle has been constructed and computer simulation studies based upon this model have been performed. This work has been carried out in collaboration with Dr. Jacob Rootenberg (Electrical Engineering) and Mr. Robert J. Bogumil (a graduate student at the School of Engineering and Applied Sciences). Dr. Inge Dyrenfurth (Obstetrics and Gynecology), with Dr. Tawfiq Rizkallah (Obstetrics and Gynecology) and Dr. Michelle Warren, a United States Public Health Service Trainee, have determined the levels of estradiol, estrone, progesterone, follicle-stimulating hor-

mone (FSH) and luteinizing hormone (LH) throughout 18 cycles in women with normal ovulatory cycles. In addition, urinary estradiol and pregnanediol have been measured, permitting a comparison between the changes in blood and urinary steroids.

Studies of the ovarian hyperstimulation syndrome in women treated with gonadotropins have been continued, and hormone response patterns have been examined in eight patients.

Dr. Michel Ferin has developed a radioimmunoassay for plasma estradiol and estrone. This method employing antibodies to estradiol, produced by the hapten principle, is remarkably specific and sensitive down to levels of 50 picograms of estrogen. Dr. Ferin, working with Dr. Antonio Tempone, a trainee from the University of Buenos Aires, and Dr. Joseph Raziano, a United States Public Health Service trainee, has continued his physiologic studies with antibodies to estradiol and progersterone.

Dr. John M. Bedford (Anatomy) and his group have continued their investigation of the developmental changes taking place in spermatozoa, "capacitation," as they pass through various channels of the male and female reproductive tract.

Experimental work in Dr. Bedford's laboratory has also been directed to the mode of entry of the fertilizing sperm into the egg, to the development of an objective quantitative test to estimate the fertility of semen, to changes in the acrosome and to the plasma membrane of the sperm cell during the final stages of its maturation in the testis, to the relative effect of follicular fluid on capacitated and non-capacitated sperm, and to the importance of the vaginal sperm pool for normal fertility in the rabbit.

Dr. Joel Rothschild (Biochemistry) is working on the phenomenon of "decapacitation" of sperm resulting from contact with seminal plasma. Dr. Harold Calvin, having completed three years of post-doctoral work at the University of California in Berkeley, under the Institute's sponsorship, has returned, to resume his work on the biochemistry of sperm.

Dr. Moshe Markowitz (Urology) has continued his work on germ cell metabolism in oligospermic patients utilizing the techniques of radioautography. Dr. Markowitz also has been studying the effects of a new progestational antiandrogenic drug, SH 714 (ciproterone acetate) on the testis.

A research group, directed by Dr. Burton Lerner (Psychiatry), functioning as a section of the Family Planning Development Research Unit, is studying the psychosexual determinants of the spacing of

conceptions. Working on this program with Dr. Lerner are Dr. Michael Beldoch (Psychiatry) and Dr. Hannah Kapit (Psychiatry).

The Institute is actively collaborating with the laboratory of Dr. Robert E. Canfield (Medicine) on a research project to determine the structure of human chorionic gonadotropin (HCG). Frank Morgan, a protein chemist from Australia, who is a Fellow of the Institute, is the principal investigator in the studies of the chemistry of this hormone. Dr. Peter Carmel (Neurological Surgery) is organizing a group of investigators studying reproductive neuroendocrinology. Initial studies deal with the role of bioamines as controlling factors in the release of LH. Studies have also been started on the anatomy of the hypothalamus of the Rhesus monkey, and a stereotaxic atlas of this region is being prepared.

Division of Bio-mathematics and Demography

With the resignation of Dr. Mindel C. Sheps, M.D., Professor of Public Health and Administrative Medicine, at the beginning of the current year, Dr. Jeanne C. Ridley assumed direction of the programs in this division. In September 1969, Dr. Harriet Presser (Public Health and Administrative Medicine) was appointed to the staff and assumed responsibility for the New York City Fertility Survey, a project which had been temporarily suspended in 1968. Dr. Moni Nag (Anthropology), interested in the relationship of cultural patterns and fertility, has also joined the division this year.

A research study on the changing status of women and family planning in the United States since World War II, under a grant from the National Institutes of Health, has been a particular project of Dr. Ridley. The project is concerned with various facets of the relationship between family planning and the status of women and includes such topics as the following: fertility and family planning practices, family stability, maternal and child health, the social and economic welfare of women, their education and their labor force participation. A paper on the roles and status of American women was presented by Dr. Ridley at a conference sponsored by the Fogarty International Center of the National Institutes of Health.

The plans commenced nearly two years ago for a New York City fertility survey are being currently redesigned by Dr. Presser. Data concerned with the demographic, sociologic, biologic and economic aspects of natality will be collected on various groups of women living in New York. In addition, the report will provide facts for estimating the need,

demand, and possible uses for services such as pre-and post-natal care, family planning, and health care of infants and children.

The computer simulation study of human fertility has been continued. This concerns the quantitative effects on natality of the various demographic and biological factors which influence fertility behavior, the evaluation of the sensitivity of different natality indices, and investigation of sampling problems. REPSIM-A, the first of two computer simulation models used in this project, utilizes Monte Carlo methods to generate the reproductive history of a birth cohort of women. The results of a continuing analysis of the data emanating from this model were utilized in two papers, one of which has been published and another accepted for publication in 1969. Work on REPSIM-B, a more flexible computer simulation model based on REPSIM-A, has also been continued and will have the special attention of Lawrence Finison and a recent addition to the staff, who will deal with the technical and analytical aspects of REPSIM-B.

Dr. Nag has conducted research on three related topics. The first was concerned with marital patterns in the island of Barbados and their effects on fertility. The second, which culminated in a seminar sponsored by the World Health Organization in Geneva, deal with the relationship between some aspects of sexual behavior and fertility, particularly the frequency of sexual intercourse and abstinence. This paper will be published by WHO in a forthcoming volume entitled *Field Studies on Human Reproduction*. Dr. Nag is currently engaged in writing a book on the interrelationship between culture and human fertility.

Dr. Ridley has participated in several activities in the field of demography. She serves on a panel for the National Institutes of Health Center for Population Research and on the Nominating Committee of the Population Association of America. She is on the editorial board of *Demography* and a contributing editor for *Social Biology*.

Division of Program Development and Evaluation

In the second year of its existence, this division under the direction of Dr. Samuel Wishik, expanded its activities considerably. In addition to progressing on previously initiated projects, major attention was given to the establishment of bases in this country and abroad upon which will be developed both independent and collaborative field research.

From last year's report it will be remembered that the principal objective of this division has been to

develop techniques for the evaluation of the effectiveness of various special programs for family planning. These would be devised in particular to identify certain early indicators of change in reproductive patterns in the people under the influence of a specific type of program. This general objective has required the development of a central unit at the Institute, but in addition selective peripheral field stations in the areas of the world where typical family planning programs are available for evaluation.

A basic contract with the United States Agency for International Development for the establishment of foreign field stations for evaluation studies, closed on June 30, 1969, the last day of the previous fiscal year, governs subsidiary contracts for projects to be arranged and funded in various countries. The first such subsidiary contract or "task order" provided funds of \$88,000 per year to the Division's central office. Other task orders are about to be closed for El Salvador and Costa Rica and invitations have been received from Ecuador, the Dominican Republic and the Philippines.

A variety of smaller but related projects have been started. These concern such subjects as the following: prediction of continuity of contraceptive practice; the postpartum interval before the return of menstruation, an obviously important indication of the resumption of fertility; the effects of location, distance and transportation on the attendance of family planning clinics; the designing of standards for the classification of women according to the health and social risks that might result in pregnancy; the motivations and reactions to the operation of surgical sterilization of women; the study of the methods to estimate the frequency of induced abortion, and other subjects.

A study of the adaptability of maternity or obstetrical services as centers for the dissemination of family planning knowledge and service is being conducted by the Institute jointly with the Population Council. The effectiveness of the so-called "post-partum family planning clinic", when deliveries have occurred in organized obstetrical hospitals, seems to have been well demonstrated both in the United States and abroad in the many programs developed in the last four or five years. This experience, and the number of theoretical reasons for confidence in the effectiveness of family planning education during pregnancy, has stimulated a world study on the availability of obstetrical services to women living in rural areas, especially in the developing countries. Theoretical estimates made by Dr. Howard Taylor, Director of the Institute, and Dr. Bernard Berelson

of the Population Council, a few years ago, suggest that the cost of establishing combined maternity health and family planning services throughout the world would not be prohibitive and might serve as a basis for a total world program. In order to check these theoretical projections, surveys are now being made in ten countries to determine whether the theoretically estimated costs of establishing and maintaining joint maternity and family planning programs were approximately correct. In order to set up the Institute's share of the study, Drs. Wishik and H. Clay Frick, (Obstetrics and Gynecology), visited the Philippines and the Punjab in India; Dr. Robert Neuwirth, (Obstetrics and Gynecology), and Dr. Frank Mount visited the State of Orissa in India; Dr. Mount, Kenya; and Dr. Donald Helbig, M.D., Research Associate, Colombia. It is believed that the result of these studies should be very important indeed and might provide a base for a really integrated world program.

Division of Reproductive Morphology for Training and Research

This division was formed in response to the concern over observations reported in the last year, suggesting that the long use of the contraceptive "pill" might give rise to premalignant changes or even cancer of the cervix uteri. This unproven possibility has made it mandatory that additional studies be set up and also to train qualified personnel to supervise the cancer detection services that should be associated with family planning clinics. Besides this special undertaking, the new division will apply morphological techniques, such as electron microscopy and histochemistry, to problems of basic research in the field of reproduction and to the study of various possibly deleterious side effects of contraceptive drugs, both those now in use and new ones certainly to be developed.

A special interest of Dr. Ralph Richart (Pathology) working with Dr. Neuwirth, has been the attempt to develop methods for the chemical occlusion of the fallopian tubes as a simpler method of sterilization. The importance of some form of sterilization in fertility control programs has been demonstrated by the very large number of vasectomies, now counted in the millions, that have been carried out during the last few years in India. The simplicity of the method in the male has led to its popularity, but it is believed that a similarly simple method in the female, would have an even wider acceptance. The work carried out in the Institute, has been directed to the discovery of particular chemical and caustic agents which would be effective and safe.

Studies have been carried out in rabbits and monkeys. The success of the entire principle depends also on the development of appropriate instruments for the delivery of the agents to the human fallopian tubes through the cervical and uterine canals without the necessity of an abdominal incision.

In an attempt to increase the interest of physicians and scientists throughout the world in such simple sterilization procedures, the Institute, in association with the National Institute of Child Health and Human Development, sponsored a four-day meeting on the techniques of human sterilization in October 1969. This meeting was attended by more than fifty scientists from the United States and abroad, dealing with the clinical, experimental, and bio-engineering aspects of the human sterilization techniques.

The Unit for Family Planning Service and Research

In collaboration with the Department of Obstetrics and Gynecology, a new unit is being developed to study and provide for the family planning needs of the patients of the Medical Center and of the neighborhood. Dr. Elizabeth Connell (Obstetrics and Gynecology), has been appointed Director of this unit. With her will be associated Mrs. Linbania Jacobson, a graduate nurse and candidate for the degree of Master of Science in Community Health. This unit will be responsible for developing and correlating the family planning services in the Sloane Hospital and Vanderbilt Clinic, in a new family planning unit being developed under the auspices of the Department of Health of the City of New York at the Francis Delafield Hospital, and in a community clinic, run by the Community League, on Amsterdam Avenue and 159th Street. Dr. Connell and Mrs. Jacobson both have had considerable experience with this kind of work in New York City and it is believed that the program will develop rapidly as soon as it is initiated in January 1970.

The Margaret Sanger Memorial Affiliation

It will be remembered that on September 19, 1968 the agreement was signed by the University and the Margaret Sanger Research Bureau, providing that the Bureau would move from its present location of West 16th Street to become the clinical division of the new Institute as soon as facilities were available. The Bureau, with 46 years of pioneering experience behind it, continues its active program of research and training. Its services report a continuing increase in patient attendance. In 1968 there were 13,639 patient visits to the Birth Control Clinic and 6,367 visits to the Fertility Division. At the end of

the first nine months of 1969 there were 600 more patient visits to the Birth Control Clinic than during the entire preceding year and 200 more to the Fertility Division. The clinical research program, which involves the trial and acceptability of various contraceptive methods, listed 4,276 patients under observation at the end of September 1969.

In the fall of 1969 the Bureau, carrying forward its pioneering tradition, established a vasectomy service, the first out-patient clinic of its kind in the country. The project has been carefully prepared, providing for a thorough review of indications in each case, and for the collection of suitable social, psychologic and biologic data.

The Laboratories of the Obstetrics and Gynecology Division of the Harlem Hospital

The research group of the endocrine laboratories of the Department of Obstetrics and Gynecology of Harlem Hospital Center was relocated in new quarters at 315 West 125th Street in New York City and is supported in part by the Institute. The new facility consists of a well equipped suite of laboratories totalling approximately 3,800 square feet. The laboratory is under the direction of Dr. Muriel Feigelson (Biochemistry), and is devoted to the study of physiological and biochemical problems in the field of reproduction. One of its major programs is concerned with mechanisms of postnatal enzyme development, with particular respect to the changing content of the liver in histidase, an enzyme which is undetectable in the fetus, appearing first after parturition and increasing remarkably during puberty, apparently as the result of estrogen stimulation. The second project concerns the protein patterns in rabbit oviduct fluid, which are being studied because of their evident importance in the process of fertilization and the possibility of finding a practical contraceptive measure.

An Information Service

The Institute is collaborating with the Population Council, with the support of the Ford Foundation, in the development of an Information Service on population problems to a large and varied audience. The Institute's share of this work has been the preparation of a manual for the teaching of reproductive physiology and family planning, for use by teachers, especially of medical students, throughout the world. This venture is sponsored by the International Federation of Gynecology and Obstetrics, with an editorial board selected to represent various countries, particularly those from the developing world. It is hoped that this text can be developed

with a loose-leaf format and that information added at regular intervals will keep the teacher up to date. The text, it is planned, will be given free to professors of Obstetrics and Gynecology and other teachers throughout the world, and a series of suitable slides for projection provided. Such a text, with its international endorsement and the plan for its constant updating promises to be a direct answer to the repeated criticisms that medical students are being insufficiently taught in these subjects.

Extramural Activities

The outside activities of the members of the staff of the Institute reflect the breadth of its subject matter and its international point of view. Dr. Wishik, after conducting a two-week training program at the Institute for a group of WHO directors and consultants from regional offices and the headquarters in Geneva, accompanied the trainees to Taiwan to supervise their field observations. He has served as a consultant to a dozen organizations, including the World Health Organization, Pan American Health Organization and several foreign governments. Dr. Vande Wiele has lectured at the University of Paris School of Medicine and at the Laurentian Hormone Conference and has been a visiting professor at the University of Buenos Aires. Dr. Bedford has lectured at the Worcester Foundation for Experimental Biology, at the Biosciences Symposium Sponsored by Schering in West Berlin, at the Peter Bent Brigham Hospital in May, 1969 and for the American Society for the Study of Reproduction at Davis, California in September. Drs.

Lieberman and Taylor served on the Biomedical Advisory Committee of the Population Council and Dr. Taylor on its general Advisory Committee. Dr. Taylor will serve as President of the Sixth World Congress of Gynecology and Obstetrics, which it is expected will be attended by about 8,000 specialists when it meets in New York City in April, 1970. On November 6, 1969, he received the Thirteenth Annual Honorary Lecture Award from the Albany Medical College, giving an address on "The Physician and the Population Problem."

From the foregoing report, it seems evident that the Institute has established a base in most of the more important areas relevant to the population problem in accordance with the original outline of its plans. The possible failure of the present United States Congress to appropriate the funds in the grant approved by the National Institute of Health to make up the amount needed for construction of the building has given an air of uncertainty during the year just past. Nevertheless the unique importance of the field, the "population explosion" and other problems incidental to the phenomenon of human reproduction, gives us confidence that the delay will be a short one and financial support for an undertaking so painstakingly begun, and in such a vital field, will be forthcoming.

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Institute of Cancer Research

SOL SPIEGELMAN, *Director*

JACOB FURTH, *Acting Director*

The past year has witnessed a significant reorganization of the Institute of Cancer Research. Dr. Jacob Furth served as Acting Director of the Institute until July 1, 1969, when Dr. Sol Spiegelman assumed the responsibilities of permanent Director. As indicated in the following paragraphs, significant progress was made in several of the investigative programs of the Institute during the year, and it is anticipated that the over-all activities of the Institute will continue to expand and develop toward the ultimate goal of a solution to the cancer problem.

Dr. Jacob Furth and his associate, Dr. Shoichi Takizawa have been investigating diverse problems related to hormonal control of mammary tumors. The tasks involved are: distinguishing *in vitro* hormone responsive from nonresponsive autonomous tumors; identification and quantitation of the hormones which are responsible for growth of the mammary gland and influence progression of the hormone responsive tumors. For this purpose, model systems have been established in the rat by isolating and defining diverse types of the desired mammary tumors; isolation of the pituitary hormones of the rat which control the mammary gland (mammatropes); analysis and quantitation of these hormones; definition of the relation of these hormones to the mammary gland and mammary tumors *in vitro* (organ cultures) and *in vivo*. The latter is attained by grafts of tumors in hosts variously conditioned by ablation of related hormone secreting

organs (ovary, adrenal and pituitary) and treatment with large quantities of isologous hormones and growth factors.

Cooperative studies are being conducted with colleagues at the Endocrine Division of NASA, NCI Mammotrope Panel, concerned with quantitation of hormones by radioimmunoassay; identification and characterization of viral particles in tumors; localization of the respective hormones and their receptor sites; characterization of nucleic acids; and, role of specific hormones in induction of diverse neoplasms by dimethylbenzanthrene.

Dr. Elliott Osserman and his associates Dr. Barbara Bick, Dr. Mehdi Farhangi and James Halper, medical student, continued the long-term clinical investigations of patients with multiple myeloma, macroglobulinemia and related plasma cell dyscrasias. The principles of chemotherapy and general management of myeloma were further defined and evaluated.

A comprehensive survey of serum and urine lysozyme levels in various disease states was completed by Drs. Bick and Rosenblum and Miss Helen Byrne. Significant increases in serum and/or urine lysozyme concentrations were documented in chronic infectious diseases, particularly tuberculosis, active sarcoidosis, renal homograft rejection reactions, and monocytic dyscrasias. The potential usefulness of lysozyme assays of serum and urine in the clinical assessment of these conditions is now well confirmed.

Studies were continued of both human and experimental monocytic leukemias and the associated increase in lysozyme production in collaboration with Dr. Henry Azar.

Dr. Philip Feigelson and his associates, Drs. Jacques Hanoune, Katsuro Koike, William Poillon and Fu-Li Yu, have continued and extended their investigations of hormonal mechanisms which regulate rates of nucleic acid synthesis, physiological and physico-chemical processes which control levels of enzyme activity. A program directed toward the development of inhibitors of tryptophan oxygenase activity with view to their possible utilization as anticarcinogenic agents was also undertaken.

Dr. I. Bernard Weinstein, in collaboration with his colleagues, Drs. Dezider Grunberger, Louis Fink, Karl Lanks, Tomatsu Goto, Manjul Agarwal, and Susumu Nishimura, has been studying the role of transfer RNA (tRNA) in the regulation of protein synthesis. Employing a variety of chromatographic techniques, an extensive profile of the tRNA population present in normal rat liver has been obtained.

Dr. Robert DeBellis and Mrs. Marianne Mortara have continued their studies of nucleic acid synthesis by isolated nuclei.

Dr. Richard S. Rivlin and his group, Gail Wolf and Steven Fass continued their investigations of hormonal and nutritional regulation of cell metabolism in normal and neoplastic tissues. Particular attention was paid to the action of thyroid hormone, the control of vitamin utilization, and the metabolism of aromatic amino acids.

Experiments are currently in progress in collaboration with Dr. John C. Sinclair (Pediatrics) attempting to measure oxygen consumption in riboflavin-deficient rats.

The search for an understanding of nutritional disturbances in cancer patients has led to an exploration of riboflavin metabolism in experimental neoplasms.

The Endocrine Out-patient Clinic at Francis Delafield Hospital provides a growing resource for the study of endocrine problems in cancer. An attempt has been made to attract patients with unusual features. A number of patients with tumors of the pituitary and of the thyroid gland have been treated, and valuable experience has been gained in the management of these conditions.

Since coming to the Institute of Cancer Research in July, 1969, Dr. Sol Spiegelman and his associates, Drs. David Bishop, Arsene Burny, Kuei-huang Huang, Miloslav Travnicek, Kenneth Watson, Jeffrey Schlom, Yafa Keydar, M. R. Das, Donald

Mills and Fred Kramer have instituted a new program in viral oncology. Their approach stems from earlier investigations with Q β , an RNA virus which infects *E. coli*. The enzyme (Q β -replicase) induced by this virus has been purified from infected cells. It has been shown that this enzyme can catalyze the indefinite synthesis of biologically competent and infectious RNA. Using this enzyme they have shown that they could synthesize variants of the original viral RNA. Of great interest was the demonstration that by suitable adjustment of the synthetic conditions they could achieve the synthesis of a whole variety of variants possessing virtually any set of preassigned desirable features. Thus, defective variants were produced which could no longer cause the disease because they had irreversibly lost a necessary part of their genetic information. Nevertheless these abbreviated variants combined a high affinity for the replicase and a very much more rapid growth rate than the original virulent viral nucleic acid. The variants compete effectively for replicase and thus halt the production of infectious virus particles. These experiments opened up a novel pathway towards the synthesis of highly specific and replicating chemotherapeutic agents with a real potential for controlling diseases induced by viral agents.

It is clearly of great interest to see whether the techniques and concepts which have emerged from the Q β studies can be extended to animal and more particularly human systems. To this end, a study has been initiated with oncogenic viruses, particularly those involved with lymphomas and leukemias. Efforts are at present concentrated on the following three agents: 1) the avian myeloblastosis virus (AMV), 2) the Rauscher leukemia virus (RLV) and 3) the Moloney leukemia-sarcoma complex (MSV-MLV).

These were chosen because they are all RNA viruses and possess certain technically advantageous features. Further, a good deal of their biology and pathology has been worked out.

Although this effort has been in progress for only six months it is clear that the enzymological technology of the Q β -system is applicable to these systems. Enzyme preparations have been isolated from cells infected with the AMV and Rauscher viruses which respond under the proper conditions to RNA isolated from the corresponding virus particles. The product synthesized is as large as the template added.

The attempt must now be made to scale up the enzyme preparations so that they can be brought up to a state of purity comparable to that of Q β .

epicase. The desired variants against these oncogenic viruses can then be synthesized and tested for therapeutic activity.

Honors

Dr. Spiegelman served as Director of the course in DNA/RNA hybridization in Pavia, Italy; Special Lecturer, 100th Anniversary of the Discovery of Nuclear Gases; and Special Lecturer at 2nd International Symposium on Tumor Viruses. Dr. DeBellis became a member of the Society for the Study of Blood. Dr. Osserman received an American Cancer Society Research Professorship. He became a member of the Damon Runyon Scientific Advisory Board, and the United States Public Health Service Cancer Research Center Study Section. Dr. Rivlin became a member of the American Physiological Society. He was also certified by the American Board of Internal Medicine.

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Institute of Comparative Medicine

Ross M. GREY, D.V.M.

Curator of Animal Husbandry and Chairman of Institute of Comparative Medicine

The department provided veterinary care and animal husbandry services for 64,209 research animals of 22 species during the year as well as consulting services to the investigators for the Medical Center including those at Delafield Hospital, Psychiatric Institute, and the Eye Institute. Veterinary services were also extended to St. Luke's Hospital and Brookdale Medical Center, both Columbia affiliates.

Continuing to operate under the Laboratory Animal Welfare Law (P.L. 89-844) the facility was inspected monthly by the United States Department of Agriculture with no deficiencies reported. Of the 160 medical, dental and veterinary schools in the country, the department is one of 40 accredited by the American Association for Accreditation of Laboratory Animal Care. Many foreign and other visitors toured the facility through the year and anyone may visit the facility upon appointment.

Two programs were sponsored by the department for high school and local community children and the establishment of a 4-H program for inner city children continued to be explored.

The department facility and staff participated in an animal care training program operated by the New York Zoological Society and DeWitt Clinton and Theodore Roosevelt High Schools which was financed through state funds. Young men interested

in animal care actually apprenticed to experienced animal caretakers as they went about their daily duties during the morning and then attended classes in their own school in the afternoon in laboratory animal science.

Under the direction of Dr. Doris Mitchell the Children's Council for Bio-Medical Careers, a voluntary organization representing a cross section of the various health professions, brought local community children to the Medical Center for the purpose of developing a positive relationship between the children and the Center and to orient the children to the potential for vocational careers in the area of the health services. The program included 80-120 children from the Washington Heights areas ranging from 9-14 years in age. The programs were financed by a grant from Mr. Arthur Krim, two grants from the Columbia University Urban Center, and grants from the College of Physicians and Surgeons and Dr. J. Lawrence Pool.

In cooperation with Dr. John Budinger, pathologist for Lawrence Hospital and consulting pathologist for the Bronx Zoo, the department conducted a graduate elective seminar in comparative pathology for the Department of Pathology. Outside lecturers for this series were Dr. William Hardy, Sloan-Kettering Institute, on feline leukemias, and Dr. Lennart Krook, Cornell University Veterinary

School, on periodontal disease in animals. The seminar discusses common biological disease processes in humans and animals and presents naturally occurring animal diseases which serve as models for the study of human diseases. Zoonoses are discussed and a field trip was made to the ASPCA hospital in New York.

A shorter elective seminar was also given to acquaint students who are interested with the field of laboratory animal medicine. This seminar is part of the Disease Review Series of the Department of Pathology.

In house training programs, as well as those spon-

sored by the American Association for Laboratory Animal Science, were utilized for the continuing education of the animal technicians in the department.

The chairman continued on the advisory council for the Animal Science Department at the State University Agricultural and Technical School at Delhi as vice-chairman and became president-elect of the American Society of Laboratory Animal Practitioners. Several "on-site" visits for the American Association for Laboratory Animal Care and the National Institutes of Health were made during the year.

Medical Library

THOMAS P. FLEMING

Professor of Library Service

The steady increase in the number of books and periodicals published annually, combined with the expansion at the Medical Center in terms of additional and modified programs of instruction, changes in research emphasis and patient care, have serious space, staff, and budget implications for the Medical Library.

This year the Library increased its collection by a net 8,946 volumes. We now have 301,601 bound volumes in addition to various collections of materials whose count in comparable terms occupies the space equivalent to an additional 5,000 volumes. The Library receives 4,386 serials currently. Almost all languages of the world are represented in the collection. Since our net additions each year total roughly 9,000 volumes, it follows that an equal number must be removed.

Although our Library tries to be self sufficient, we realize that no one library can hope to meet all the needs, or acquire all materials both current and retrospective, that may be needed by its clientele. As a result we turned to our sister institutions for assistance and borrowed 736 volumes, a slight increase over last year's figure of 626. Most of the volumes were borrowed from the National Library of Medicine, the New York Academy of Medicine, and the Medical Research Library of Brooklyn. Our loans to other libraries which we try to restrict to uncommon materials, increased from 2,679 volumes last year to 2,845 this year. We loaned to libraries in Denmark, France, Canada, Nigeria, United

Kingdom, and the Netherlands, in addition to the United States.

We loaned 52,949 volumes for a two week period and an additional 5,177 volumes were loaned for a two hour and/or overnight loan. We estimate via a spot check that 112,203 volumes were consulted in the library and that 109,923 persons used the library.

The Bibliographic Service conducted by the reference librarians provided 7,347 citations to the literature for investigators in various departments in the Medical Center based on their detailed interest profiles. This year forty-nine subjects were searched. We are currently searching the literature on twenty-one subjects for fourteen scientists in eleven departments. The Library also prepares MEDLARS searches which are conducted by the National Library of Medicine.

Many of the various school and departments within the Center availed themselves of the services of the Library by requesting lectures on the use of the literature for their students and staff. The Library regrets that the Medical School students have not had this service in the past several years and hopes that in this next academic year it will be possible to schedule literature utilization lectures for the medical students.

The Medical Library again served as the laboratory for 35 students in the special graduate courses in medical and science librarianship which are given by the Medical Librarian at the Medical Center,

under the auspices of the School of Library Service. Dr. Lai-Bing Kan, the librarian from the University of Hong Kong Medical Library spent six months in the Medical Library as an observer. Librarians from various parts of the United States as well as from Japan, Thailand, Hong Kong, Iraq and Israel visited the Library during the year.

The Library had two major exhibits this year. The first was in honor of Dr. Rudolph N. Schullinger. The second was part one of a two part exhibit on the History of Genetics. Coordination and cooperation was maintained by exhibit and other activities with the P&S Medical History Society and the Program in the History of Medicine sponsored by the Institute for the Study of Science in Human Affairs.

The following appointments were made: Karen Hall, Reference Librarian; Judith Lechner, Assistant Reference Librarian; Janice Kaplan, Assistant Reference Librarian; Elisabeth Neimeyer, Assistant Reference Librarian; Parkinson Information Center: Patrick D. J. Rae, Head, Information Services; Dr. Naomi Joachim, Literature Analyst; Dr. Pavol Badinka, Literature Analyst; Dr. Cibor Kaigl, Literature Analyst; Dr. George Balint, Literature Analyst; Valerie Feinman, Reference Librarian.

The following promotions were made: Dr. Frank Kriz, Head, Medical Cataloguing Section was promoted to Assistant Coordinator of Cataloguing, Columbia University Libraries. Dr. Vera Ortynsky, formerly Reference Librarian in the Medical Library was promoted to Head, Medical Cataloguing Section.

Staff members of the library continue to be active in various professional organizations. Dr. Thomas P. Fleming is a member of the Executive Committee of the Advisory Council of the Regional Medical Library of New York State and Northern New Jersey. He is also a member of the Executive Committee of the Advisory Council of the Medical Center of Metropolitan New York. Professor Fleming continued his membership on the Subcommittee on Orthopedic Information of the Committee on the Skeletal System of the National Academy of Sciences, National Research Council.

Cecile E. Kramer taught the course on human factors in medical library administration, one of the Continuing Education courses given at the annual convention of the Medical Library Association in Louisville, Kentucky. She is a member of the Advisory Committee to the Lillian R. Hayt Memorial Library, Hospital Educational and Research Fund, and attended this committee's annual meeting in Albany, New York. Miss Kramer was ap-

pointed to serve on the Ad Hoc Committee to Review Goals and Structure of the Medical Library Association.

Sophie Gerlach, Head, Medical Reference Section, was Program Chairman of the New York Regional Group, Medical Library Association.

Miss Betty Rose Moore, Librarian, Francis Delafield Hospital and Institute for Cancer Research, attended the Third International Congress of Medical Librarianship, Amsterdam, The Netherlands.

Patrick D. J. Rae, Head, Information Services, Parkinson Information Center, served as Editor of the Metropolitan N. Y. Chapter of the American Society for Information Science.

The Library continued to verify bibliographic citations included in all articles accepted for publication by the *Journal of Clinical Investigation*, whose editorial offices are located in the Medical Center.

The Medical Library was the recipient of many valuable gifts of books, periodicals and manuscripts. Limited space does not permit a listing of all our donors, but they have our deepest appreciation. These gifts enable us to provide extra copies of heavily used titles, and in some instances bring to the Library unique material. More than 31,000 items were received this year. Dr. Jerome P. Webster continued his past generosity in support of the Jerome P. Webster Library of Plastic Surgery. The David Byron and Ira Olsan Gift, established in 1962 continues to provide a generous sum of money each year for the acquisition of monographs.

The services of the Medical Library Center of New York, of which Columbia is a member, continues to be of assistance to us via its daily trucking service for interlibrary loan pick-ups and deliveries, deliveries of materials we have shelved there in rented quarters, through its acquisition of unique materials and through its Union List of Serials activities. We withdrew from our collection and sent to the Medical Library Center more than 530 volumes. An additional 8,269 newly received items were sent to the Center. These items represent titles which we felt should be available in the local area, but would not be in such heavy demand by the Medical Center clientele to warrant providing shelf space for them.

The Parkinson Information Center, the first of four neurological information centers established by the National Institute of Neurological Diseases and Stroke, has completed its sixth year of operation. The recent promising results in the treatment of Parkinsonism with L-DOPA has led to increased demands from the scientific community for in-

formation in this field. The current awareness publication Parkinson Disease and Related Disorders: Citations from the Literature is being mailed to more than 2,000 scientists and departments of neurology throughout the world. More than 30,000 citations to documents have been stored on magnetic tape at the Columbia Computer Center and the SUNY Biomedical for use in on-line retrieval. In the past year, using this data bank, the Parkinson Information Center has compiled bibliographic information in response to requests from scientists. More than three thousand requests for copies of the literature searches prepared by the Center have been filled. The Parkinson Information Center has continued its cooperative arrangement with the National Library of Medicine, to process literature for inclusion in MEDLARS and Index Medicus. At the World Congress in Neurology held in New York in September, a special booth depicting the services of the Parkinson Information Center attracted considerable attention. Here was installed and operating an IBM2740 terminal with direct access to the data bank in Syracuse from which pertinent information was supplied on demand. Some 365 scientists from all over the world including 217 from foreign countries took the time to fill out a detailed interest profile for inclusion in the Center's International Directory.

One of the most exciting and encouraging events

of this past year was the concrete progress made on plans for a new library building. The site was confirmed and the buildings on that site are being torn down; an Advisory Committee for the Augustus Long Medical Library was named and has held a number of meetings during which a building program was developed; the firm of Warner, Burns, Toan and Lunde was named as the architects for the new library; and preliminary sketches have been made.

The Medical Librarian acting as Professor of Library Service assigned to the Faculty of Medicine and as Head of the Medical Sciences Division of the Columbia University Libraries provides administrative direction for libraries associated with the Faculty of Medicine but not funded by income from the Columbia Corporation. The libraries involved are The Jerome P. Webster Library of Plastic Surgery, The Neurological Institute Library, The Library of the Francis Delafield Hospital and Institute of Cancer Research, The Library of the Division of Program Development and Evaluation of the International Institute for the Study of Human Reproduction, and the Dr. Louis T. Wright Memorial Library of the Harlem Hospital Center. The co-ordination of these various libraries results in a more effective utilization of staff, resources and services of Columbia in meeting the overall problem of transfer of medical information.



Report of the Dean of the Faculty
of Dental and Oral Surgery
School of Dental and Oral Surgery
Columbia University in the City of New York

Report of the Dean of the Faculty of Dental and Oral Surgery

During 1969 the School entered a new era of dental education. The major portion of the teaching and clinical facilities have been completely modernized. All of the equipment in the seventy-station main clinic is mobile and designed to permit single student or group tutorials to be conducted right in the clinic. Mobile consoles have been provided for the staff so that each teacher has a teaching center.

The staff appointments reflect the direction of the School during the year. The objectives are to reassess all of the School's activities in an attempt to align more closely to the state of the art and science of dentistry both the curriculum and the means of implementing it. The staff has undertaken a revision of the curriculum designed to take advantage of new knowledge and to take the steps necessary to reorient all of the activities of the School in the direction of prevention of disease, and treating disease which already does exist or will exist in spite of all other measures. Great stress is being placed on the periodontal basis of dentistry. The curriculum has been designed to integrate anti-caries and anti-periodontal disease measures. It has been designed to make students aware of the basis of iatrogenic dental disease and the means of preventing it.

The curriculum has the potential to produce a new type of dentist who can so reduce dentist-patient time that he alone will be equivalent to a force of many dentists. What is proposed is to prepare each graduate to provide the potential for a major source of relief for the now seemingly overwhelming problem posed by existing health needs versus available manpower.

The combined activities of this School are integrated to produce a significant advance in the solution of the dental health needs of this and other countries by producing a graduate whose conceptual base has been so broadened that he can prevent, recognize, and treat more dental disease than previously could be expected of any individual dentist.

Divisional status was restored to Operative Dentistry, and Dr. Edward A. Cain, Jr., was appointed Director. The new multi-track curriculum was introduced to the first-year class in September.

In order to "swing" the second-year student into a semi-multi-track program, the preclinical course is being reorganized with a reduction in time and

utilizing a new and dynamic approach. It will be conceptual in nature and biologically based, utilizing a staff-student ratio of 1 to 8, small group seminars and demonstrations, and clinical observation sessions with fourth-year students as clinical preceptors.

A course entitled, "Correlative Seminar," was introduced this year to the fourth-year students. It is designed to stimulate discussion at an advanced level in the biological aspects of clinical dentistry and to solidify the concept of total health care. In addition, each fourth-year student will be given an opportunity to elect an area of study.

The Division of Orofacial Development, established July 1, 1969, is directed by Dr. Sidney L. Horowitz. The educational objective of this division is to provide students with an understanding of child growth and development, particularly as these phenomena relate to the development of facial form and to the function of the masticatory system. The curriculum of the division includes coursework in the development of the dentition (second-year), statistics and epidemiology (second-year), orofacial growth and development (third-year), human genetics and dentistry (third-year) and clinical conferences in development of children with congenital craniofacial defects (third- and fourth-years).

In the Division of Orthodontics, the pre-doctoral third-year course in orthodontics is being completely revised. It included a reduction in laboratory instruction time in favor of more time devoted to lectures and seminars on the theory of orthodontics. This is designed to better prepare these students for an elective in orthodontics to be offered next year. This year, an elective in orthodontics is offered to the fourth-year class.

In the post-doctoral curriculum, a new course was initiated for the post-doctoral class in orthodontics which entered in September, 1969. It is an intensive and broad survey course designed to present a comprehensive view of the entire field of orthodontics in order to orient the student early in his course of study.

In Pedodontics emphasis on preventive dentistry was increased in didactic and clinical phases of the pre-doctoral curriculum. This consisted of broader discussion of caries activity tests and their signifi-

cance, and application in clinical practice. A comparatively new test, based upon presence of dextran in the mouth, which indicates degree of susceptibility to decay is now applied to all children admitted for treatment in the Children's Clinic.

At the post-doctoral level there is increased emphasis on dental growth and development. In clinical practice at this level children with a broad variety of severely handicapping conditions and disturbances in tooth formation are observed frequently. The newer knowledge of the phenomena involved in normal dental growth and development has improved the ability of our post-doctoral students to interpret these disturbances intelligently and to recommend sound corrective measures.

There was increased clinical activity in prevention of disorders of occlusion. More students performed pulp management procedures, with the result that premature loss of teeth was prevented for more children. Premature loss of teeth is a major factor in producing malocclusion. Prevention of malocclusion with space management appliances was also part of the increased emphasis on prevention.

The curriculum revision at the School, both conceptually and physically, catapults the Division of Periodontics into a more important and central role in the educational structure, with increased course hours and greater emphasis on the periodontal basis of dentistry.

The Division of Preventive Dentistry and Community Health was established on February 1, 1969, under the direction of Dr. Irwin D. Mandel. Members of the division play major parts in the courses Introduction to Dentistry I and II as well as participate in the other courses previously mentioned as emphasizing preventive dentistry. Dr. Harold Applewhite is in charge of a modified course, "Community Health," and a new course, "Social Dynamics," and a modified course, "Systems of Practice."

Divisional status was restored this year to prosthodontics, and Dr. John J. Lucca was appointed its director. The entire course for the various disciplines within prosthodontics is being revised so that there will be much more conceptualization and biologic orientation, with less emphasis on manipulative skills on models, except those skills necessary for actual clinical situations. As previously reported in the area of operative dentistry, there will also be elective courses in prosthodontics available to six to eight students who wish advanced study.

In the Division of Stomatology numerous improvements have been realized through the continued support of the National Cancer Institute. The Clinical Stomatology Conferences have been dou-

bled in number permitting the presentation of a far greater number of tumor cases before the combined third- and fourth-year dental classes, postgraduates and dental hygiene students. For the first time the conferences have been made available to outside practitioners as well as to interns and residents of neighboring hospitals. The attendance at these sessions has been most gratifying.

The new cancer teaching program also includes attendance by upper-class dental students at the Head and Neck Tumor Clinic Conferences and the various clinics, wards and operating rooms of the Medical Center. In addition, a new series of twelve lectures has been introduced. These are designed to more fully acquaint the dental student with the methods of diagnosis and modalities of treatment of neoplastic diseases as practiced by the surgeon, the radiotherapist, the dermatologist and the otolaryngologist.

The undergraduate dental hygiene programs have been redesigned to place greater emphasis on primary and secondary preventive services that may help to insure oral health as a right for all people.

In line with the University's plan to improve conditions in Harlem, members of the dental and dental hygiene staff and the New York City Department of Health have designed a pilot dental health education and service program for a Haryou-Act Neighborhood Center at 47 West 126th Street, under the supervision of Assistant Professor Diane Curl.

Students in courses for dental hygienists add to the health of the community and specifically to dental health through their participation in community services and educational programs.

The registration for the School of Dental and Oral Surgery in September, 1969, was as follows:

Undergraduate Program	161
First year	46
Second year	45
Third year	36
Fourth year	34
Non-credit Postgraduate Courses.....	70
Postgraduate Certificate Courses	107
Endodontics — First year	4
Second year	4
Third year	4
Fourth year	2
Oral Surgery — First year	6
Second year	6
Third year	4
Orthodontics — First year	22
Second year	21

Pedodontics	— Second year (full time)	3	The following degrees and certificates were ap-
	First year (half time)	2	proved by the Faculty and awarded by the Uni-
	Second year (half time)	2	versity:
	Third year (half time)	1	Degrees:
Cerebral Palsy Fellows	— First year ...	2	Doctor of Dental Surgery..... 23
	Second year .	1	Bachelor of Science in Dental Hygiene.. 19
Periodontics	— First year (full time) ..	8	Master of Science in Dental Hygiene... 18
	Second year (full time)	8	
	Second year (half time)	2	Certificates of Training:
	Third year (half time)	1	Oral Surgery 3
	Fourth year (half time)	3	Orthodontics 23
Prosthodontics	— First year (full time) ..	1	Pedodontics 1
Courses for Dental Hygienists.....		57	Periodontics 4
Junior year		30	
Senior year		17	
Master of Science		10	
GRAND TOTAL		<u>720</u>	

Dental and Oral Surgery

MELVIN L. MOSS

Dean of the Faculty of Dental and Oral Surgery • Director of Service

New appointments to the staff of the Department of Dental and Oral Surgery were: Professors of Dentistry, Herbert J. Bartelstone, Robert Gottsegen and Sidney L. Horowitz; Visiting Professor, Pieter Dullemeijer; Adjunct Professors Neal W. Chilton and Philip Person; Associate Professor Harold L. Applewhite; Assistant Professors David Kaplan and Margaritis Z. Pimenidis; Adjunct Assistant Professors, Raymond F. Johnson and Philip J. Santora, Jr.; Assistant Clinical Professors, Richard Moskow and Maxwell Widrow; Instructors, Earle R. Bassett, Paul R. Bjorklund, Neil B. Epstein, Francis J. Faggella, Edward Greenfield, Miss Janet K. Hotger, Neal L. Kaplan, Harijendra S. Khurana, Walter I. Lipow, Norbert Ripp, Kenneth L. Siegel, Miss Kathleen Silko, Ronald N. Singerman, Marvin Solomon, William Steibel, and Nicholas A. Vero; Lecturer, Lilian H. Bachman; Research Associate Franciscus J. M. Huijbregts.

The following promotions were made: George L. O'Grady to Professor; Victor S. Caronia, Henry I. Nahoum and Mrs. Patricia A. McLean to Associate Professor; Miss M. Diane Curl, Miss Mary J. A. Wehrle, and Albert Zengo to Assistant Professor; Joseph M. Leavitt and Melvin L. Morris to Clinical Professor; Joseph C. De Lisi, Joseph E. Fiasconaro, Edward P. Kesseler, Bernard S. Moskow, Fred Rothenberg, and Harold Sherman to Associate Clinical Professor; Howard I. Blum, Roy Boelstler, Herman Cantor, Murray A. Cantor, P. Charles Gabriele, Arnold M. Geiger, Fredric E. Goodman,

Stephen F. Goodman, Alvin J. Grayson, Albert Green, Irving A. Karel, Paul Kornfeld, Eugene P. La Sota, George V. Lyons, S. Abel Moreinis, Ronald B. Odrich, George Rudensky, John M. Scarola, Robert N. Schiff, Bert B. Schoeneman, Louis R. Sharpe, Alexander B. Smith, Morton J. Stern, and Howard B. Vogel to Assistant Clinical Professor; Henry Barnaby, Jr., Bernard H. Benkel, Abraham M. Blechman, John E. Cinguina, John V. Donovan, John A. Flavia, Burton Langer, Frank L. Mellana, David M. Monahan, Joseph A. Pianpiano, Joseph M. Ragosta, Morton C. Rennert, Charles S. Solomon, and Salvatore J. Squatrito to Instructor.

The following changes in title were made: Robert E. Herlands to Adjunct Professor and George W. Hindels to Adjunct Associate Professor.

The Division of Orthodontics and the School suffered a severe loss in the accidental death on April 13, 1969, of Dr. E. Clinton Vollmer, Instructor in Dentistry.

Professional posts held and honors received by the various members were: Dr. Jerry J. Adelson, General Chairman, Annual Convention, Third Vice President, American Dental Association; Dr. Howard A. Arden, member Executive Council of the Greater New York Academy of Prosthodontics; Dr. Reynold J. Baumstark, President, Western Westchester Dental Society; Dr. Roy Boelstler, Assistant Director, Greater New York Gold Foil Study Club; Dr. Sebastian A. Bruno, Vice President, American Academy of Maxillofacial Prostheses; member, Ex-

ecutive Council of the Greater New York Academy of Prosthodontics; Dr. Jack Budowsky, President, American Association of Industrial Dentists; member, Radiation Hygiene Committee of First District Dental Society and Dental Society of the State of New York; Miss Diane Curl, President, Dental Hygienists Association of the City of New York; Dr. Rudolph H. Friedrich, Vice Chairman, Section on Oral Surgery, Anesthesia and Hospital Dental Services, and member Planning Committee for Conference on Teaching Pain Control in Dental Schools, American Association of Dental Schools; member, Committee on Hospital Oral Surgery Services, American Society of Oral Surgeons; Dr. William Greenfield, Vice President, New York State Society of Oral Surgeons; Chairman, Committee on Anesthesia, American Society of Oral Surgeons; American Association of Dental Schools; Miss Janet K. Hotger, Member, Program Committee, American Dental Hygienists Association; member, Committee on Dental Hygiene Education, New York State Dental Hygienists Association; Dr. Austin H. Kutscher, Chairman, Section of Pharmacology and Therapeutics, American Association of Dental Schools; Editor, Association of Pharmacology and Therapeutic Teachers in Dentistry; Editor, Pharmacology and Therapeutics in Dentistry; member, Editorial Advisory Board of the Bulletin of the Drug Information Association; member, Council on Dental Therapeutics, American Dental Association; Executive Editor of The Archives of The Foundation of Thanatology, and American Journal of Therapeutics and Clinical Reports; member, Association of Behavioral Scientists in Dental Research; Dr. Richard J. Lowell, President, New York State Dental Society of Anesthesiology; Dr. John J. Lucca, member, Executive Council of the Greater New York Academy of Prosthodontics; Chairman-elect and Secretary, Prosthodontics Section of the First District Dental Society; Dr. Irwin D. Mandel, Cancer Scientists Award from the Health Research Council, City of New York; Dr. Louis Mandel, Editor, Bronx County Dental Bulletin; Dr. Frank L. Mellana, Chairman, Operative Section, First District Dental Society; Secretary, Greater New York Gold Foil Study Club; Dr. Richard Moskow, Board of Directors and Seminar-Chairman, Midtown Society; Dr. Solomon N. Rosenstein, Delegate of New York State Society of Dentistry for Children to American Society of Dentistry for Children; Dr. Daniel D. Schube, Treasurer, Eastern Dental Society; Miss Kathleen Silko, President, Pennsylvania Dental Hygienists Association; Dr. William H. Silverstein, Director, Greater New York Gold Foil

Study Club; Director, Metropolitan Gold Foil Study Club; Dr. Alvin L. Solomon, President-elect Eleventh District Dental Society; Dr. Ennio L. Uccellani, Chairman, Local Arrangements for the Greater New York Academy of Prosthodontics; Miss Mary J. A. Wehrle, Chairman, Program Committee, American Dental Hygienists Association; Dr. Edward V. Zegarelli, Vice President, Board of Dental Examiners of the State of New York; Chairman, Examination Review Committee of the Northeast Regional Board of Examiners; Board of Directors and Professional Education and Grants Committee, American Cancer Society, New York City Division; Vice Chairman, Section on Oral Diagnosis and Oral Medicine and Chairman, Program Committee, American Association of Dental Schools.

During the past year the Division of Oral Surgery provided consultation in response to requests from supervising physicians on the wards of The Presbyterian Hospital for 255 patients.

Oral surgical care was rendered 301 patients of The Presbyterian Hospital in the Oral Surgery Clinic. The clinic provided oral surgical consultation and care on request from the clinics of The Vanderbilt Clinic to 1,629 patients. The Oral Surgery Clinic rendered oral surgical consultation and care to 2,888 patients referred from the undergraduate clinics of the Dental School.

The Orthodontic Clinic provided 6,749 patient visits. Of these, 642 visits were made by patients of the Vanderbilt Clinic. Consultations were afforded 264 patients, and the number of patients receiving active orthodontic treatment averaged 297 throughout the year, each patient making approximately one visit every three weeks. In addition, about 10 patients were seen on an observation basis at varying periods during the year.

The Division of Operative Dentistry treated 673 patients during the past year in the Dental Clinic.

The Division of Pedodontics conducted two active programs of clinical teaching with excellent cooperation from the members of the teaching staff. In the Children's Clinic, which is conducted mainly for undergraduate activity 210 children from two to ten years of age were admitted for complete diagnosis and treatment. There were 1,230 visits, and a total of 1,911 treatments per visit. Of these, 46 involved pulp management procedures necessary to save extensively decayed teeth which otherwise might have been condemned to extraction and premature loss. About 14% of the children in this activity were very young with severe dental problems, and they were assigned to first-year post-

raduate students in pedodontics; the remainder were assigned to fourth-year undergraduate students.

In the Cerebral Palsy Dental Clinic, devoted entirely to postgraduate clinical training and research, 70 patients with cerebral palsy and other handicapping conditions were admitted for complete dental care. There were 993 visits and 2,410 completed procedures and treatments, with an average of 2.4 procedures per visit.

The Division of Prosthodontics treated 382 patients during the past year in the Dental Clinic. Of that number 60% were Dental School patients and 40% were referred from The Vanderbilt Clinic. The Hospital Dental Service provided care for 30%.

Drs. Kutscher and Zegarelli, together with other members of the staff of the Division of Stomatology, have continued their clinical investigations and have further substantiated the effectiveness (usually of a suppressant nature) of unmedicated and medicated long-lasting lozenges in the management of various erosive and ulcerative diseases of the mouth of local and systemic etiology.

Drs. Edward A. Cain, Thomas W. Portway and Roy Boelstler are continuing their investigations of the sealing properties and hardness of powdered gold as a restorative dental material in the human dentition. They are also studying the sealing properties of and pulpal response to the new plastic esthetic restorative materials in the human dentition.

Dr. Kenneth C. Deesen is continuing to broaden the applications of intra-oral photomicrography in teaching both the pre-clinical and clinical phases of operative dentistry. An instant close-up intra-oral system is being developed with the support of the Wood Foundation.

Dr. James W. Benfield is investigating new methods for the refinement of dental castings.

The research program of the Division of Oro-facial Development is centered in its growth laboratory which is devoted to the acquisition and analysis of longitudinal developmental records of children with varying types of birth defects, including endocrine and cytogenetic disorders. In addition, Dr. Horowitz (in conjunction with Dr. S. Weisbroth, SUNY, Stony Brook; Dr. L. Ehrman, Rockefeller University and Dr. Letty Salentijn, Anatomy, is conducting research into the inheritance and pathologic morphology of malocclusion in the domestic rabbit. Dr. Edward C. McNulty is engaged in studies of craniofacial variations among different ethnic groups.

Dr. Solomon N. Rosenstein continued evaluation of findings of earlier clinical studies undertaken in conjunction with members of the Department of

Pediatrics: dental findings in three-year old survivors of prematurity on two different antibacterial drugs (with Dr. William A. Silverman and others); dental findings in a large group of well babies observed in a combined Sloane-Pediatrics study.

Drs. Seymour Koster and Rosenstein continued their study of oral disorders resulting from muscular incoordination in children with cerebral palsy involving the head and neck.

Drs. Marvin B. King and Rosenstein continued their clinical study of the feasibility of extensive dental procedures for older patients with cerebral palsy.

Drs. Arnold Rosenberg and Rosenstein continued their clinical study of space management and tooth guidance in developing dentitions of young children with premature loss of teeth following early rampant decay.

Both laboratory and clinical research were conducted by members of the Division of Periodontics. Several broad problem areas are under study. The bacteriology and chemistry of the gingival sulcus are being studied as follows: Dr. Seymour Algu - PH of periodontal pockets; Dr. Murray Cantor - experimental gingivitis study; Dr. Bernard S. Moskow - the effects of human bacterial isolates on the production of periodontal lesions in the gerbil and immunofluorescent studies on dental plaque; Dr. Morton C. Rennert - periodontal disease in the mongolian gerbil, dietary influences; and Dr. Bernard H. Wasserman - bacteria induced periodontitis in mongolian gerbils.

Several studies are underway on problems of implants and transplants on periodontal tissues by Dr. Cantor on acrylic tooth implants; Dr. Melvin L. Morris on root and bone implants; Dr. Moskow on the clinical and histologic effects of marginal repositioning of alveolar mucosa and measurements of strength of cemental dentin interface.

In addition, a long-term study of the relationships of tooth position and occlusion to periodontal health or disease is being conducted by Drs. Wasserman and Herman Geiger. The first year's computerized results are becoming available.

Dr. Irwin D. Mandel's major research efforts are concerned with: a) composition and mechanism of formation of dental plaque and calculus; b) the characterization of the protein components of the salivary secretions; c) diagnostic aspects of salivary secretion and composition; d) salivary factors in caries resistance.

Dr. Stephen Wotman has been examining neurohumoral aspects of salivary secretion and composition. In association with Drs. John H. Laragh and

Leslie Baer of the Department of Medicine, he has been studying salivary electrolytes pre- and post-surgically in primary and pseudo primary aldosteronism. He has also been studying the salivary changes associated with the use of lithium caronate and L-Dopa. Salivary composition is becoming an increasingly valuable aid in the diagnosis and evaluation of various systemic diseases and in the study of the effects of a number of pharmacologic agents.

Dr. Ephraim Weinstein is continuing his characterization of gingival fluid and its relation to periodontal disease. Dr. Albert N. Zengo has been studying a variety of local environmental and genetic factors associated with caries resistance. He has also been investigating the effect of adrenergic agents on salivary composition in the rat. Dr. Kenneth L. Siegel is evaluating various scoring techniques for dental plaque and calculus. Dr. Harijendra S. Khurana is developing improved techniques for the electrophoretic and immunologic examination of salivary secretions.

In the Division of Prosthodontics, Dr. Herbert D. Ayers has several research projects under way including the physical properties of balsa wood points and their capacity in temporary displacement of teeth; the improvement of a technique already developed for comparing the resistance of soft tissue to displacement; a pilot study to estab-

lish a technique for measuring changes in denture position with time; and structures and concentration of metals in and adjacent to an amalgam joint.

Drs. Ayers and Joseph C. De Lisi are continuing their study with Dr. Kutscher of the effect of denture adhesives on oral tissues. Drs. John J. Lucca and Ennio L. Uccellani are serving as consultants in this study.

The School of Dental and Oral Surgery wishes to express its appreciation for contributions made in support of its program by many individuals and organizations. Among these donors were: the National Institutes of Health, Bristol-Myers Co., Colgate-Palmolive Company, Forest Laboratories, Block Drug Company, Mr. Frank T. Weston, Isadore and Pauline Hirschfeld Foundation, Dr. Abraham Friedman, Sam S. Shubert Foundation, Samuel J. and Evelyn L. Wood Foundation, Mr. Louis A. Ferris, American Fund for Dental Education, Aqua-Tec Corporation, William Heller Foundation, Columbia University Orthodontic Alumni Society, Dr. Robert J. Huettner, Dr. Herbert Weiss, Mr. and Mrs. Alfred W. Kleinbaum, Mr. Charles E. Pallesen, Rogosin Foundation, Warner-Lambert Company, Columbia University Association of Dental Alumni, Miss Elizabeth Achelis, Dr. Joseph M. Leavitt, Class of 1934, Dr. Robert M. Cole and Dr. Robert H. Alexander.

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Reports of Women's Auxiliaries

The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. ALLEN F. MAULSBY, *President*

The Board of Women Managers of the Babies Hospital during 1969 gave considerable time and thought to the facilities and services which can be provided when the promise of additional space in the new building becomes a reality, and the renovation of the old building begins. We have watched with interest the erection of the framework, and have considered the floor plans. Though we realize allowance must be made for delays in financing and completion, we are unanimous in feeling that each step taken must be toward providing optimum use of the space. One example of our concern shows in the formation of a Joint Planning Committee with members of the Orthopedic Board. Mrs. Bradley I. Collins has been appointed to serve as Chairman of this committee and is studying the recreational facilities in the departments of Pediatrics and Orthopedics with the hope of consolidating them as more space becomes usable. It is also hoped by the Board that room will be set aside for private patients and adolescents.

Our monthly meetings have been well attended, and we are indebted to our speakers, Doctors Edward C. Curnen, Jr., Sidney Blumenthal, Mary Jane Jesse, Mr. Alvin J. Binkert and Miss Agnes Dilworth. We welcome Mmes. Keith Moffat, Andrew C. Wetmore and Daniel B. Strickler, Jr. to the Board. Mmes. Douglas Williams, Lewis Harder and Robert H. Burrows have transferred to Associate membership and Mrs. John Gay has resigned. Our annual luncheon was held at the hospital in April this year, and was greatly enjoyed by all the members and guests.

Announcement was made in June of the completion of fund raising for the new Intensive Care Nursery in memory of Dr. Linnaeus E. LaFetra, which is to be installed on our twelfth floor. My thanks are heartfelt to all those who have made this possible, especially to the trustees of the Mary Flagler Cary Trust and Mrs. Flagler. We have had many other very generous gifts to the Development Fund earmarked for Babies, for which we are particularly grateful: from the Altman Foundation, Avon Products Foundation, The Beauford Charitable Trust, Mr. August Belmont, Mr. John E. Bierwirth, Mrs. Neville Booker, The Brady Foundation, Mr. A. Braga, Mrs. Charles P. Cooper, Dublin Fund, Inc., Mr. John Fay, Mr. & Mrs. Perry E. Hall, Hallmark Gallery, Mrs. Roscoe C. Ingalls,

Junior Cotillion, Joy Hirshon Parkinson Foundation, The Alfred T. Stanley Foundation, J. P. Stevens & Company, The Valley Foundation, The Vanneck Foundation and to Mr. Arthur Watson and to the other donors who have helped us raise a total of \$527,496 during 1969.

The Board has spent \$6,000.00 for the Emergency Nursing Fund, Recreational Therapy and other projects. Much of this was possible due to the constant efforts of Mrs. K. Herluf Trudso, Chairman of our Thrift Shop Committee, who raised \$21,529.10 during the year. It is my earnest hope that she will be given more help in this great undertaking, and I want to thank her, Mrs. Herman Hoops, Miss Hope Kingsley and the dedicated volunteers for their important work.

Mrs. Bradley I. Collins again served as Chairman of the Recreational Therapy Committee and had a very busy year due to the relocation of the department. While the new space is well decorated, we are glad that it is only temporary as there is not enough room to care properly for all our patients. Miss Cynthia Lepore and her assistants have done an outstanding job, including giving many parties to entertain and cheer the children.

Mrs. John S. Tilney as Chairman of the Nursing Committee has worked closely with Miss Jane McConville, who was appointed Director of Nursing for Babies. She succeeded Miss Marjorie Peto, who had been at Babies for 23 years. Many of our members attended a tea in her honor upon her retirement in June, and it is with deep sorrow that I report her death on September 30, 1969.

The constructive suggestions of our visiting committees have been reported at each of our meetings, and many of the conditions have been rectified. We hope to have better lighting installed in the wards and semi-private rooms and Mrs. Orson Munn, as Chairman of the House Committee, is consulting on redecorating as it becomes necessary.

Mrs. Iredell W. Igglehart was our Group Leader for the United Hospital Fund, and Mrs. John J. Weinberg was Chairman for Box Week. Our total for the Fund was \$25,415.43 and for their efforts Miss Kingsley and Mmes Burrows, Igglehart, Rose, Walker, Weinberg and Maulsby were on the Honor Roll.

We have enjoyed the Auxiliary Lunches with Mr. Binkert and appreciate this pleasant way of keeping

in touch with the other units of the Medical Center. Volunteers contributed 15,129 hours to the smooth and efficient running of all our floors and I want to thank each one of them.

In closing, I want to thank the chairmen of each of our committees for their loyal and dedicated service, which has been of great help to me during

the year, and the officers and members of the Board for their enthusiasm and quick response to requests for advice and support. It has been a privilege to work with Mr. Long, Mr. Binkert and Dr. Curnen, and I particularly thank our Unit Manager, Miss Elizabeth Callahan for her never failing help to me and the Hospital.

Cribside Social Service Committee

MRS. WILLIAM E. HILL, *Vice President*

On behalf of the Cribside Social Service Committee of the Board of Women Managers of the Babies Hospital, it is my honor to submit this report.

As its share, the Cribside Committee allocated \$300 toward the seminars which were conducted for the Social Service Staff during 1969. We have also authorized the expenditure of up to \$500 toward the education of our social work staff in group work techniques. Our greatest expenditure continues to go toward our Social Service Department's salaries, of which we paid \$29,537.67 during 1969.

Our Committee has continued to help the families of our children with Thanksgiving and Christmas gifts. We provided camp experience during the summer, sending 134 children on vacation of not less than twelve days, for which we paid \$3,241.35. Parents contributed \$150 toward this amount. This summer change is greatly beneficial to our youngsters as it helps them in learning to get along with their peers, their teachers and their families.

Our Committee has continued interest in the Christmas party for our clinic children, along with the Residents' Wives Committee.

We have contributed \$2,000.00 to the Emergency Nursing Fund.

We have also approved the use of our Endowed Beds for 11 needy and deserving patients through the year.

Our ability to meet all these expenditures lies on

the success of our Thrift Shop. It is only through the tireless efforts of our Thrift Shop Chairwoman Mrs. K. Herluf Trudso, and her dedicated Committee, Mrs. William R. Fisher, Mrs. Maria H. Gilbert, Mrs. John P. Bochow, Mrs. Felix Pierre, Mrs. Felix Mart, Mrs. Paul Stern, Mrs. Herman J. Hoops, Miss Hope Kingsley, Mrs. Thomas Buckner, Mrs. Willard Austin and Miss Ethel Donaghue that the Shop is a financial asset. We are most grateful to all the members of our Thrift Shop Committee. We are also indebted to those on our Board and their friends who thoughtfully and faithfully donate rummage continuously through the year.

The United Hospital Fund and the United Fund of Greater New York have given us a total of \$12,318.00.

The Lenten Sewing Class donated \$490.00 as well as a large supply of receiving blankets, infant sweaters, booties and bonnets. These have been given to our needy infants, primarily in the Neonatal Nursery.

I am most grateful for the cooperation of all our Committee members of the Board of Women Managers and wish to express appreciation to them, the administration and to Miss Agnes D. Dilworth and our Social Service Staff at Babies Hospital for their helpful guidance and loyal support.

We also wish to thank The Havens Relief Fund for their generous gift.

The Mary Harkness Auxiliary

Mrs. GEORGE B. GIBBONS, *Chairman*

The Mary Harkness Auxiliary has continued to provide a modest program for the Mary Harkness Unit in Portchester, New York.

Its seventeen members have met five times during the year at the Unit to discuss the various projects. In each of these meetings, Miss Del Mar, administrator of Mary Harkness, has given a report on the number of patients admitted for extended convalescent care and the nature of their illness. She has kept us informed, at the same time, of the problems facing the nursing, housekeeping, food service and maintenance staff. Occasionally, she has asked for some needed articles of clothing, prizes for the weekly games of Bingo, and entertainment programs. We have supplied these things. Operating on a budget derived from members' dues and the profit from the Country Store, we have provided two television sets for the Unit, numerous Bingo prizes, weekly movie, and a party at Christmas, with presents for the patients and the staff.

This party at Christmas is delightful. The girls choir from the Rye Presbyterian Church sing new songs and familiar carols, after which delicious refreshments are provided. Indoors and outdoors the

Christmas decorations make Mary Harkness warm and home-like.

Beside these projects, the Auxiliary has maintained a modest service program. Six members, with the assistance of Mrs. Harsteen, receptionist for the Unit, operate a store, which provides small necessities for the patients.

They also welcome and help orient the patients admitted daily to the Unit.

One Auxiliary member works every week as an aide for Mrs. Susan Millman, the occupational therapist for Mary Harkness.

All the members attend at some time the monthly luncheons for the Auxiliaries at the Presbyterian Hospital, at which Mr. Binkert gives us news of the Medical Center and acquaints us with the vast problems of the Hospital.

We accept with regret the resignation of Mrs. Robert Archer, who leaves to be married. We wish her every happiness.

We welcome a new member, Mrs. Aubrey Whittmore.

I would like to thank all the members of the Auxiliary and express my appreciation for their interest and cooperation.

Neurological Institute Auxiliary

MRS. JOHN L. WEINBERG, *Chairman*

The Neurological Institute Auxiliary has had a successful year, enthusiastically continuing its activities in behalf of the hospital and expanding its membership, welcoming Mrs. Niels L. Low and Mrs. James W. Correll.

The two major fund raising activities were the United Hospital drive and the collection of Thrift. Through their persistent, consistent efforts, Mrs. Charles E. Adams and Mrs. H. McLeod Riggins, co-chairmen, engineered a vigorous and enthusiastic drive. Of \$21,640.00 donated, \$9,340.00 came as direct benefit to Neurological Institute.

Mrs. Royall Cannaday, chairman of the Thrift Shop Committee is an indefatigable worker valiant in the face of the constant challenges such as rising costs and in meeting the difficulties of collecting donated Thrift. Aided by Mrs. H. Houston Merritt, Mrs. Charles Stroud and Mrs. Everett Hoskins the shop produced \$15,687.06 sales for the year. It is with heartfelt sadness I report the death of Mrs. Frederick Borch. Active in each facet of the work of the Auxiliary, her constant warmth, interest and help will be missed by all. A special fund of \$4,397.81 has been given by her friends in her memory.

Maintaining its energetic support of the patient care activities of the Social Service Department at Neurological Institute, the Auxiliary carries a substantial share of the financial costs of the Department. Up to one-half of the Auxiliary's yearly budget is devoted to Social Service salaries, amounting to \$26,894.44 in 1969. In addition \$17,786.20 was provided for the patient care: funds for camp, appliance purchases, cost of transportation to hospital and clinic, homemaker services and direct maintenance funds. The Auxiliary has also supported the development and in-service training programs and special projects such as the doctoral research program on patient care discharge planning.

Sending children to camp is an ongoing major interest of the Auxiliary. Expenses for camp this year totalled \$16,529.50. This supplied 60 camp placements for Seizure Clinic children in seven overnight camps and one day camp. The Big E has maintained its camp scholarships at the Crystal Run Camp and School this year making 40 placements available at a cost of \$11,700. As part of this year's program a vocationally oriented work camp experience was initiated for a selected group of older adolescents. There is a great need for additional opportunities to

help handicapped adolescents make the transition from school to work, and the Auxiliary has been interested in lending support to such experiments in the field. The Society for the Relief of Women and Children has contributed \$500 toward the camp program of Haven Relief Fund Society. Contributions of \$500 donated through the auspices of the almoner, Mrs. Charles E. Adams, \$106 went toward camp scholarships. Parents paid as much as they were able and the Neurological Institute Auxiliary met the balance of \$3,633 needed to complete the camp program.

Because of the shortage of experienced professional social workers, an ongoing staff development program has been important to the department of service training. The Auxiliary has supported a proportional share of an ongoing seminar program of the overall department and provided \$760 as summer salary for a college student interested in social work, as an aid to the effort of recruitment to the field of social work. We are deeply grateful for the perceptive guidance of Miss Jean E. Collard, head of the Social Service Department in the Institute. Her broad vision of patient care and her dedication inspires us all.

Another interest of the Neurological Auxiliary has been the doctoral scholarship program, begun in 1968, to support a large research study on patient care discharge planning. This study reviews the needs for post-discharge care of all patients discharged from the Institute over a four-month period and will aid the Institute in community planning and cooperation for better service to its patients.

In 1969, the Neurological Auxiliary spent \$5,004.04 providing for recreational therapy; \$1,900 toward support of the Presbyterian Hospital Volunteer Department; and \$5,566.98 for expenses at the Milbank Library.

The recreational therapy program supported in cooperation with the Presbyterian Hospital Auxiliary has been expanded during 1969 with Mrs. Arlene Katz and her assistant, Miss Hoffstetter working under the supervision of Mrs. Eleanor Shelly, Chief Occupational Therapist. We regret the loss of Mrs. Katz whose vitality and interest did much to ensure the success of the program and who resigned in December to live in Mexico. The recreational therapy cart goes to Neurological Institute three mornings a week and covers the 3rd, 4th, 5th and 6th

tors. Several volunteers are working in the program if more are needed. Sewing animals, leather work, crocheting and knitting are currently popular activities. Patient's payments cover the cost of supplies. Mrs. Rollo Masselink has served as our dedicated chairman of the Library Committee and has given unstintingly of her time weekly taking the book cart Neurological. Mrs. Edward Gardner has been interested in providing art for the Institute and having donated \$200 as an art fund, replaced faded pictures in the 3rd and 4th floor waiting rooms with four attractively framed and interesting reproductions. Several other members of our Auxiliary have worked actively as volunteers in the Institute. Mrs. Karl T. Chadsey, Jr. participated in the doctoral research program. Mrs. George Spater and Mrs. Edward Schlesinger served as volunteer visitors of the combined Community Council and United Hospital committee on Nursing Homes, an important aid to the Social Service staff in securing needed information about appropriate discharge facilities. Mrs. J. Lawrence Pool gave her time working on the House Committee. The Auxiliary is very proud to have had one of its members, Mrs. Byron Stookey, chosen to be a member of the Board of Trustees of the Presbyterian Hospital.

One of the highlights of the year was the spring meeting and luncheon. Following Dr. Richard L. Masland's fascinating talk on the roll of the Institute in the spectrum of medical Services and its achievements, the Auxiliary adjourned for lunch at Harkness Hall where Miss Crawford, Director of Nursing, gave her views on the serious problems in this crucial field. After lunch, Miss Catherine Gallagher, the retiring Unit Manager of the Institute, was presented

with a gold watch as a token of our gratitude and admiration for her years of accomplishment.

We are fortunate to have as our new Unit Manager Miss Ann Cavanagh. Miss Cavanagh's background has given her the opportunity to see the workings of a hospital from many perspectives. After two years at Skidmore, she transferred to Columbia where she graduated with a B.S. in nursing. After working in Surgical Nursing at Presbyterian Hospital she moved on to Assistant Unit Manager serving in the front offices and Unit Managers' offices in several of the units at the Medical Center and, then she spent a year in the Medical Data Processing Department.

Among the other events at our meetings were a trip in May to Mary Harkness with a talk by Miss Margaret Del Mar, a talk by Dr. Melvin Yahr on the dramatic new drug L-Dopa used in treating Parkinsons disease, and an interesting description of the development and needs of the 5th floor Neurological clinics by Dr. M. H. Charleton. In spite of his crowded schedule and myriad responsibilities, Dr. Richard Masland has on each occasion found time to give interesting introductions to our speakers. His interest, wise counsel and quiet understanding are a constant piloting encouragement.

In closing, I would like to say how much we enjoy Mr. A. J. Binkert's monthly lunches which contribute so much to closer communication between the administration and all the auxiliaries and through which we gain a glimmering appreciation of the enormous problems with which the hospitals cope each day. I want to express my feelings of indebtedness and gratitude to each member of the Neurological Auxiliary for their generous effort and cooperation.

Women's Auxiliary of the New York Orthopaedic Hospital

MRS. JARVIS J. SLADE, *President*

This has been an interesting and constructive year for the Auxiliary.

Our meetings have been very well attended and they have been varied and informative. The May meeting, as usual, was held at the United Hospital Fund Headquarters.

At all of these meetings informative reports were given by Miss Rosemary Hoynak, our head nurse, or her associates, Miss Sophie Pasternak and Mrs. Angela Millward; our two recreational therapists, Mrs. Carl Lagergren and Mrs. Eva Hoffman, spoke to the Auxiliary regularly. Miss Elizabeth Prichard, Director of Social Service, kept the board knowledgeable regarding our Social Service Department.

Mr. Binkert's luncheons for the Auxiliaries were enjoyed by all. They provide a fund of information which brings the Auxiliary closer to the needs and interests of the Medical Center as a whole.

One new member joined the board this year: Mrs. Hugo Keim, whose husband is with the New York Orthopaedic Hospital. We are delighted to have her with us. Mrs. John Stevenson asked to be an associate member as she has temporarily moved to Washington, D. C.

The Budget for the year included support for the care of ward and clinic patients, salaries for two recreational therapists, recreational therapy supplies, partial salary for an assistant librarian in the Milbank Library and contributions for running it. The total expenditures of the Auxiliary for 1969 were \$35,574.86 which included \$15,010.00 for the ward and clinic patients.

At Christmas all of the patients, including clinic and ward, received gifts. At our board meetings we always tried to respond fully to the varied money requests presented to us.

The Auxiliary's income is derived from the United Hospital Fund direct benefits, from donations of Auxiliary members and friends, from the Mary E. Secor Trust for use in recreational therapy for children, and from an annual payment by the United Hospital Fund and the United Fund of Greater New York.

The board wishes to express its great appreciation for the gifts received during this period from Mrs.

Carl Lagergren, the Coats and Clark Company and Creative Playthings.

Mrs. Willis Reese most generously gave to the children's playroom an oven and sink built by her carpenter. Many toys and gifts for the playroom were purchased or donated during the year. There were parties for the patients at Easter, Halloween and Christmas. This past summer the board once again financed two occupational therapy aides a part of the recruitment program the United Hospital Fund sponsors.

Early in the fall the United Hospital Fund got well started under the excellent leadership of Mr. A. Neil Lilley. Mrs. Lilley and Mrs. Edward Meyer are acting as team captains. The Auxiliary raised \$34,409 and will receive \$17,949 in direct benefits. Mmes. Edward H. Gerry, William G. McGuire and Willis L. M. Reese lead the Honor Roll for their outstanding work. Honorable mention went to Mmes. William Carey and George F. Johnston. Mrs. James O'Malley, Jr. was the board's Chairman for Boxweek, and \$183.11 was raised.

Mrs. Thomas Hitchcock is the Chairman of the House Committee. Mrs. Sheldon Whitehouse is our almoner to the Haven's Relief Society and has kept the Auxiliary informed on the interesting cases that are presented to her.

We are especially indebted to Mrs. Willis Reese for helping organize and co-chair a Joint Planning Committee with the Babies Hospital Auxiliary. This Committee will discuss how the two auxiliaries can work together in the future.

Mrs. John Condliffe is our Committee Chairman on the Volunteer Committee and Mrs. Charles Grosvenor represents the Auxiliary on the Milbank Library Committee. Mrs. George Johnston is the Auxiliary's representative on the Nursery School Board.

Mrs. Sheldon Whitehouse and Mrs. Edward Gerry are members of the Board of Trustees.

My appreciation goes to the administration and staff for their constant aid and guidance. I also want to thank the entire board for their interest and support which made 1969 a constructive and active year.

Women's Auxiliary of the Presbyterian Hospital

MRS. W. DUANE TODD, President

ur Auxiliary had an active and productive year made possible by the cooperative effort of our members. Their kindness and concern, plus their constructive thinking contributed originality and inventiveness to our planning. Their genuine good will and their ready assent to do a job makes the following report a joy to write and a tribute to our members.

Our total income for 1969 was \$61,182.84. We received annual gifts of \$7,200 to the Volunteer Service; \$5,000 to Occupational Therapy; \$7,627 to Recreational Therapy; \$12,079 to the Milbank Library, with an additional \$500 for miscellaneous items; \$1,800 to the Social Service Department, of which \$500 went to the Anna Ball Kneeland Fund for staff development. A gift of \$500 was presented to the Student Nurses' Scholarship Fund. The Emergency Nursing Fund and the Emily Webster Fund each received gifts of \$1,000.

At the request of Dr. Carl R. Wise, \$2,323 was given for the purchase of 22 television sets to be used in patient areas.

Chaplain Reeves accepted, for use in the Hospital, the Auxiliary's gift of a new portable spinette. We are indebted to Mrs. H. Clay Frick, II for the time and effort expended on this project.

Our finance chairman, Mrs. José Ferrer, guided us through the year and we note, as the United Hospital Fund and our Thrift Shop wax and wane, so does our ability to give aid where it is needed.

The United Hospital Fund chairman was Mrs. Charles Flood, and her team captains were Mesdames Carl T. Nelson, Charles F. Morgan and John Schullinger. We received 681 gifts totalling \$38,038.88. \$4,700 was received for free care distribution. Direct benefits to be used for ward and clinic patients amounted to \$19,209 and the Greater New York Fund provided us with \$7,207.

We point with pride to those members making the United Hospital Fund Honor Roll: Mesdames C. Redington Barrett, Ralph Boots, Charles Flood, Herbert H. Schwamb and Maynard T. Wheeler. Honorable mention went to Mesdames Howard Bruenn and Richard T. White.

A special drive was instituted for new names for the United Hospital Fund, netting Mrs. Richard

Stock (card drawn by lot) a bottle of champagne and 90 new names for the Fund to clear. Mrs. Richard B. White provided the most names and was also awarded a bottle of champagne. In July, at Mrs. Flood's request, United Hospital Fund lists for letters were sent to our members so they could get an early start on the 1970 campaign. Mrs. Robert H. E. Elliott, Jr. joined as team captain.

We are proud of the accomplishments achieved in this campaign and extend thanks to our members, to our team captains and to the chairman.

Money is at the root of many of our endeavors and the Stuyvesant Square Thrift Shop joins the United Hospital Fund in continuing to be our life-saver and provider. Through the generous thrift contributions of members and friends, and the hard work of our dedicated volunteers, the Auxiliary is enabled to aid the hospital with considerable impact. Mrs. Robert S. Grinnell and Mrs. Walton P. Kingsley co-chair this important work and Mrs. Malcolm McAllister steered a successful course through the summer. Mesdames Grinnell and Kingsley presented the Auxiliary with checks totalling \$28,918.84. The importance of supporting the Thrift Shop through donations and volunteer work cannot be stressed enough.

Mrs. Richard DeL. Simmons was chairman of our annual benefit to stock Thrift Shop shelves. The applause still echoes for her remarkable administrative talent that produced our most successful benefit to date, held at the St. Regis Roof with luncheon and a fashion show. Designer Donald Brooks showed his fashions to about 281 guests, and was presented with our "PHaux" award for volunteering his talents. Estee Lauder provided cosmetic favors. Mrs. Leo Heiden, in memory of the late Mrs. Leicester Van Leer, provided tickets for the luncheon designated specifically for those directors of departments at the Hospital who guide us in our work.

We are indebted to Mrs. Harold D. Harvey, Social Service chairman, for her outstanding professional guidance. This is a field in which she is exceptionally adept and ablaze with a myriad of ideas. She moderated a panel discussion at the United Hospital Fund-Social Service Committee meeting on February 27. In April, Mrs. Harvey arranged with Miss

Elizabeth Prichard, Director of Social Service, a program for our Auxiliary that demonstrated the many inter-related health and social problems of one family, illustrating how social service relates to patients, their families and the community. Miss Prichard spoke briefly about cutbacks in state funds curtailing Medicaid. As a result of her talk, our Auxiliary sent a letter to Governor Rockefeller expressing our concern about these cutbacks.

Miss Prichard used the funds we gave her department in the following way: (1) special patient care needs caused by the sudden drain on existing funds due to medicaid cutbacks. (2) Social Service Staff Development Program (monies from the Anna Ball Kneeland Fund) which gives an opportunity for continued training to keep abreast with new developments in the field and aids in attracting and holding professional personnel. (3) a grant to Social Service for the summer employment of a college student. This venture is of great help in aiding the recruitment of young people into the field of social service.

One of the desired aims of our Auxiliary is to make more widely known the varied responsibilities carried by Social Service and the high quality of professional services provided to patients, to their families and to the community.

We salute Miss Prichard and appreciate her warm thanks for the over-all support given Social Service by our Auxiliary. Under Mrs. Harvey's tutelage we are not only increasing our financial aid, but have acquired a more committed outlook towards the department.

Members of our Social Service Committee participated in the joint Community Council-United Hospital Fund Nursing Home Information Program which has been of vital importance in patient-care planning and lessening delays in the discharge of patients by providing staff with quickly accessible information. This has been demonstrated at Harkness Pavilion resulting in the creation of a social work position and office there, with a fee-charging system for social services to private patients.

Mesdames Ralph Boots and Samuel W. Lambert continued as almoners for the Havens Relief Society. Funds from this society help Social Service provide assistance to patients so that they may overcome temporary hurdles.

The Auxiliary continues to have a magnificent Milbank Library chairman, Mrs. Howard Bruenn. This year we provided the library with a new swivel chair, two quiet metal tables on wheels and five special earphones to be used with the talking-book program, 12 pairs of prism glasses, five small book-holders, 46 books in Spanish and 17 in Hebrew. The

library received a gift of 96 large print books donated by the National Aid to the Visually Handicapped. Spring and Fall book sales netted \$630.

Through the library program we have found way to aid the ESH Eye Institute patients. Mrs. Franc L'Esperance chairs this program. She organized brigade of volunteers to serve at the Institute. Guide by librarian Nancy Buehler, the circulation of talking books has been greatly increased so that patient can have this service five days a week. Mrs. L'Esperance noted that items were needed in the playroom and the Auxiliary provided funds for toys, a toy chest, a highchair and other essentials. Many of our members donated toys and books. The women's ward is in need of a color TV set but funds for this project are incomplete.

The Recreational Therapy Department received formica therapy cart for wheeling supplies to patients' bedsides. An identical cart was provided by the Neurological Auxiliary. In May this new department was given desperately needed space on the 12th floor of Presbyterian Hospital. We furnished the new room with two utility tables and cabinets, and had it painted. We share with the Neurological Auxiliary the responsibility of salaries. The director is Arlene Katz, and a new assistant's post has been established, filled by Paula Hostetter. Mrs. Eleanor Shelly, Occupational Therapy Director, has the overall responsibility for this project, and Mesdames Hilary Holmes and Arthur G. DeVoe have derived much knowledge and pleasure working on this program with her.

Mrs. H. Clay Frick, II, Chairman of our Volunteer Committee, arranged the annual Volunteer Tea with Mrs. Dorothy Diamond, Director of Volunteers. Mrs. George Perera, with several other Auxiliary members, worked closely with Mrs. Frick in all phases of this joyous occasion. The volunteers' appreciation of this event was evident as cups of tea vibrated with their good will. The tea pays a well-earned tribute to all the volunteers.

We gave \$200 towards parking expenses for volunteers in hopes of removing one of the barriers to volunteer work. This was an experimental venture and it has proved a huge success under the direction of Mesdames Frick and Diamond, in conjunction with Mr. William Duffy, in charge of parking facilities. Seventeen spaces are available and the current rule is that a volunteer must have worked six months to be eligible for a parking permit.

Mrs. Frick also initiated a series of luncheon tours at the Hospital for Auxiliary members and friends (potential volunteers) to become better acquainted with the Hospital and volunteer jobs available.

Mrs. Robert H. E. Elliott, Jr., Chairman of the Nursing Committee, reported that the 11th annual card party and tea for the benefit of the Student Nurses' Scholarship Fund realized \$15,000. In the past ten years more than 125 students have received financial aid from this benefit. Mrs. Frank Stinchfield was chairman. Honorary chairmen included Mesdames Alvin J. Binkert, W. Van Alan Clark, Augustus C. Long, H. Houston Merritt and Miss Elizabeth S. Gill.

During this year Mrs. Paul Sheldon, Nominating chairman, moved to Princeton. For those who worked closely with her, this was a shattering event. Her advice was constantly sought; indeed the glue of our Auxiliary was her knowledge based on years of experience. We found, at every turn, how much we depended upon her and are grateful that she has retained her membership with the promise to attend meetings when possible. For the current President she left a gratifying slate of officers that included Mesdames Hamilton Southworth, George Carden, Jr., John Leness, Richard B. Duane, Jr. and George Wilkie.

Mrs. Maynard Wheeler graciously accepted the remainder of the nominating chairmanship term.

During this year we announce with regret the deaths of Mrs. John A. Wilshear, who devoted much time to the Thrift Shop, Mrs. Lloyd Stryker and Miss Eva Purdy. Resignations came from Mesdames Felix Mulgrew, William Sherman, Edward Howes, and James Angell. Mesdames Louis M. Rousselot and B. DeWitt Bleeker transferred from active to associate membership. Mrs. Emily Otis Barnes was granted a leave of absence. Mrs. Carolyn DeWitt became Mrs. William Gorman and moved to Baltimore. Mrs. Walton P. Kingsley transferred from associate to active membership.

Mrs. Frank Rees Smith joined our junior membership. We welcomed to active membership Mesdames Joseph A. Buda, John Dean, Andrew de Roeth, George R. Merriam, Jr., Gilbert Vosburgh and John Warren.

In January Dr. John M. Kinney spoke to the Auxiliary about the Surgical Metabolism Research, of which he is the director, and expressed his gratitude for the liquid scintillation flow monitor and pump. At a luncheon following this meeting, Mr. Alvin J. Binkert discussed current Hospital problems.

February brought an end to the presidency of

Mrs. DeVoe whose term had been an exhilarating one. She was instrumental in starting the Recreational Therapy Department that has become an essential part of Hospital life.

Dr. Lawrence J. Kolb, Professor and Chairman of the Psychiatric Service, spoke to us in May on "Community Relations as Pertains to Mental Health." We greatly appreciated his deep insight into the many facets involved in this area. Dr. Wise spoke briefly on Hospital challenges at the luncheon which followed. We remain indebted to Dr. Wise for his assistance, counsel and rewarding suggestions.

Mr. Richard N. Kerst spoke to the Auxiliary in October on "The Spectrum of Hospital Costs" providing us with informative facts and figures.

In November, Chaplain Reeves spoke to us on "Christmas at the Hospital." He left us reflecting the spirit of Christmas that came with his moving description of how the entire Hospital staff creates a majestic Christmas atmosphere, both religious and merry. Grace M. Robles, Unit Manager, ESH Eye Institute, chairs this excellent program. The thoughtful and compassionate job done by the staff filled us with admiration and was a true Christmas story as narrated by Chaplain Reeves.

Mesdames William Renert and Dilworth Cannon, members of the newly formed Housestaff Wives' Club, spoke at the December meeting and reported on their activities which range from finding housing for new interns and residents, to skiing, cooking, bridge and book clubs, as well as compiling a housestaff directory. Their sparkling report somehow, perhaps because of their youthful enthusiasm, fitted in perfectly with the Christmas season. We hope to support this group any time we are needed.

The cordiality enjoyed by our Auxiliary as we work toward selected goals is greatly appreciated. Our roster of speakers reflects the support we are privileged to enjoy and need so much. The monthly luncheons for Auxiliary presidents and their guests, are not only a gracious compliment on the part of Mr. Alvin J. Binkert, but serve to keep us well informed on current Hospital affairs. The Board of Trustees meetings, presided over by Mr. Augustus Long, have not only been educational, but have, through Mr. Long's gracious example, given the current President a rewarding view of outstanding leadership.



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Appendix

EXHIBIT A

THE PRESBYTERIAN HOS

Balance

DECEMBER

ASSETS

	<i>December 31</i>	
	<i>1969</i>	<i>1968</i>
CURRENT FUNDS ASSETS:		
Cash	\$ 1,335,329	\$ 1,480,771
Investments — bonds, etc. — at cost (market value — 1969, \$71,996)	72,002	1,167,147
Accounts receivable (less reserve — 1969, \$454,838; 1968, \$423,996)	12,255,793	12,307,811
Supplies and materials — at cost.....	1,450,493	1,061,553
Interest accrued and dividends receivable.....	885,103	927,543
Prepaid expenses	86,865	70,304
TOTAL CURRENT FUNDS ASSETS.	16,085,585	17,015,129
ENDOWMENT AND PLANT FUNDS ASSETS:		
Cash	1,165,431	414,954
Due from general fund.....		3,600,000
Investments:		
Bonds and stocks — at cost or contributed value (market value — 1969, \$107,179,421)	90,987,748	95,464,718
Real estate — at cost less depreciation.....	9,152,037	8,560,064
Other	48,993	50,246
Property and equipment — at cost (less accumulated depreciation — 1969, \$27,379,229; 1968, \$24,661,984)	62,756,808	55,208,067
TOTAL	\$180,196,602	\$180,313,178

THE CITY OF NEW YORK

EXHIBIT A

et

AND 1968

FUNDS AND LIABILITIES

	<i>December 31</i>	
	<i>1969</i>	<i>1968</i>
CURRENT FUNDS AND LIABILITIES:		
Accounts payable	\$ 4,020,676	\$ 3,004,760
Mortgages payable	2,353,386	2,595,577
Accrued payroll and other expenses.....	1,157,841	920,917
Due to plant funds.....		3,600,000
Special expendable funds (Exhibit D).....	2,877,675	2,725,943
General fund (Exhibit D).....	<u>5,676,007</u>	<u>4,167,932</u>
TOTAL CURRENT FUNDS AND LIABILITIES.....	16,085,585	17,015,129
ENDOWMENT FUNDS (Exhibits D and E).....	77,447,583	80,202,324
PLANT FUNDS (Exhibit D):		
Replacement funds	20,724,023	25,337,016
Building funds	3,182,603	2,550,642
Capital invested in property and equipment.....	62,756,808	55,208,067
TOTAL	<u>\$180,196,602</u>	<u>\$180,313,178</u>

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF OPERATING INCOME AND EXPENSES

For the Years Ended December 31, 1969 and 1968

	<i>December 31</i>	
	<i>1969</i>	<i>1968</i>
OPERATING INCOME:		
Care of patients	\$52,360,695	\$47,261,672
Other services	4,112,081	3,586,852
Transfer from special expendable funds for research, educational and other purposes (Exhibit D)	2,135,817	2,140,564
TOTAL OPERATING INCOME	58,608,593	52,989,088
OPERATING EXPENSES:		
Administration	452,973	405,337
Assistant Secretary-Treasurer	818,811	632,287
Comptroller	2,441,961	1,871,351
Public Interest	311,842	219,871
Mary Harkness Unit.....	401,860	386,261
Non-professional services:		
Buildings and grounds.....	7,541,640	6,312,004
Food service	4,616,896	4,188,646
Personnel and protective.....	920,356	743,802
Other non-professional services.....	1,496,098	1,348,076
Professional services:		
Nursing	17,546,773	15,829,613
Professional staff, doctors' offices and research.....	8,455,620	6,856,634
Special services	10,353,736	8,365,982
Vanderbilt Clinic and other.....	4,919,921	4,192,832
Provision for depreciation.....	3,077,894	2,475,539
TOTAL OPERATING EXPENSES	63,356,381	53,828,235
OPERATING LOSS	4,747,788	839,147
OTHER INCOME:		
Investment income restricted for operating expenses (Exhibit C)	593,732	549,244
Contributions	572,798	618,092
TOTAL OTHER INCOME	1,166,530	1,167,336
NET OPERATING LOSS (INCOME) (transferred to general fund —		
Exhibit D)	\$ 3,581,258	\$ (328,189)

EXHIBIT C

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF INVESTMENT INCOME

For the Years Ended December 31, 1969 and 1968

	<i>December 31</i>	
	<i>1969</i>	<i>1968</i>
INVESTMENT INCOME	\$ 5,308,547	<u>\$ 5,147,461</u>
DISTRIBUTION THEREOF:		
Investment Income Restricted for:		
Operating expenses (Exhibit B).....	\$ 593,732	\$ 549,244
Special expendable funds (Exhibit D).....	899,178	751,891
Replacement funds (Exhibit D).....	933,081	988,884
Building funds (Exhibit D).....	116,799	115,260
Investment income appropriated for additional facilities and equipment (Exhibit D).....	2,765,757	2,742,182
TOTAL	<u>\$ 5,308,547</u>	<u>\$ 5,147,461</u>

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1969 and 1968

	GENERAL FUND		<i>December 31</i>
	<i>1969</i>	<i>1968</i>	
Balance, January 1.....	\$ 4,167,932	\$ 7,791,790	
Add:			
Legacies and grants.....	89,995	187,886	
Investment income appropriated for expenditures for additional facilities and equipment (Exhibit C).....	2,765,757	2,742,182	
Proceeds from sale of real estate.....		1,299,607	
Transfer from unrestricted endowment and replacement funds.....	11,950,000		
	14,805,752		4,229,675
Total	18,973,684		12,021,465
Deduct:			
Net operating loss (Income) (Exhibit B).....	3,581,258	(328,189)	
Blue Cross and Medicare rate adjustments for prior years.....	2,069,719	(311,686)	
Expenditures for additional facilities and equipment.....	7,644,300	8,493,408	
Transfer to other funds.....	2,400		
	13,297,677		7,853,533
Balance, December 31.....	\$ 5,676,007	\$ 4,167,932	
SPECIAL EXPENDABLE FUNDS			
(For Research, Educational and Other Purposes)			
Balance, January 1.....	\$ 2,725,943	\$ 2,730,543	
Add:			
Legacies, contributions and grants.....	1,552,795	1,674,232	
Investment income (Exhibit C).....	899,178	751,891	
Miscellaneous	1,570,804	1,560,726	
	4,022,777		3,986,849
Total	6,748,720		6,717,392
Deduct:			
Transfers to:			
Operating income (Exhibit B).....	2,135,817	2,140,564	
Other funds — net	57,357	361,562	
Expenditures for property and equipment.....	225,963	236,310	
Miscellaneous	1,451,908	1,253,013	
	3,871,045		3,991,449
Balance, December 31.....	\$ 2,877,675	\$ 2,725,943	
ENDOWMENT FUNDS			
Balance, January 1.....	\$80,202,324	\$78,986,410	
Add:			
Legacies, contributions and grants.....	1,457,075	372,052	
Gains from investments sold or redeemed.....	284,846	696,039	
Transfers from other funds — net	163,338	147,823	
	1,905,259		1,215,914
Deduct — transfer of unrestricted funds to general fund.....	82,107,583	80,202,324	
4,660,000			
Balance, December 31.....	\$77,447,583	\$80,202,324	

EXHIBIT D (*Continued*)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1969 and 1968

PLANT FUNDS

	December 31	
	1969	1968
REPLACEMENT FUNDS:		
Balance, January 1.....	<u>\$25,337,016</u>	<u>\$22,665,428</u>
Add:		
Funding of depreciation.....	3,077,894	2,475,539
Investment income (Exhibit C).....	933,081	988,884
Gain from investments sold or redeemed.....	100,176	188,804
	<u>4,111,151</u>	<u>3,653,227</u>
Total	<u>29,448,167</u>	<u>26,318,655</u>
Deduct:		
Replacements and rearrangements.....	1,434,144	981,639
Transfers to general fund.....	7,290,000	
	<u>8,724,144</u>	<u>981,639</u>
Balance, December 31.....	<u>\$20,724,023</u>	<u>\$25,337,016</u>
BUILDING FUNDS:		
Balance, January 1.....	<u>\$ 2,550,642</u>	<u>\$ 2,290,470</u>
Add:		
Legacies, contributions and grants.....	1,747,635	2,984,106
Investment income (Exhibit C).....	116,799	115,260
Received from Columbia-Presbyterian Medical Center Fund, Inc.....	193,336	902,399
	<u>2,057,770</u>	<u>4,001,765</u>
Total	<u>4,608,412</u>	<u>6,292,235</u>
Deduct:		
Expenditures for property and equipment.....	1,322,228	3,950,346
Transfers to other funds — net.....	103,581	(213,688)
Loss on investments.....		4,935
	<u>1,425,809</u>	<u>3,741,593</u>
Balance, December 31.....	<u>\$ 3,182,603</u>	<u>\$ 2,550,642</u>
CAPITAL INVESTED IN PROPERTY AND EQUIPMENT:		
Balance, January 1.....	<u>\$55,208,067</u>	<u>\$44,586,958</u>
Add:		
Transfers from:		
General fund	7,644,300	8,493,408
Special expendable funds.....	225,963	236,310
Building funds	1,322,228	3,950,346
Replacement funds	1,434,144	981,639
	<u>10,626,635</u>	<u>13,661,703</u>
Total	<u>65,834,702</u>	<u>58,248,661</u>
Deduct:		
Provision for depreciation.....	3,077,894	2,475,539
Disposal of real estate — net of accumulated depreciation.....		555,047
Adjustment (net) of provisions for depreciation of, and additions to, plant and equipment in prior years.....		10,008
	<u>3,077,894</u>	<u>3,040,594</u>
Balance, December 31.....	<u>\$62,756,808</u>	<u>\$55,208,067</u>

EXHIBIT E

**THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
ENDOWMENT FUNDS**

December 31, 1969

THE PRESBYTERIAN HOSPITAL:

Adam, George Aubrey	\$ 3,322,706	Frick, The Frances Dixon, Memorial	49,514
Anonymous	254,344	General Endowment	1,702,313
Anonymous—For Support of Residency Training	145,817	Goldschmidt, Henry Philip	7,066
Arnstein, Daniel G.	346,037	Gondran, Sophie M. and Adolph L....	141,306
Atchley, Dr. Dana W.	1,388,599	Griffith, Griffith W. and Mary Jones, Memorial	1,863,675
Baker, Frances E.	13,158	Haller, Maria L.	3,687
Baker, Mrs. Frederick, Pathological Department	12,012	Harkness, Edward S.	8,745,156
Briddon, C. K., Gold Medal.....	3,456	Harkness, Edward S., Memorial	8,799,614
Brookman, Henry D.	70,653	Harkness, Edward S., Research	1,013,084
Bruenn, Dr. Howard G.	39,218	Harkness, Mary Stillman, Memorial Endowment	336,147
Cardiac Monitoring Fund of the Department of Medicine.....	29,619	Harkness, Mary Stillman, Memorial Research	62,268
Carle, Robert W., Endowed Room....	405,849	Harkness, The Mary S., for Convalescent Care	1,417,367
Carle, Robert W. and Adele S., Endowed Room	58,163	Harkness, William Hale, Memorial	54,068
Cary, Caroline Catherine.....	68,395	Hartford, The John A. Foundation	416,983
Cary, The, Endowment Fund.....	113,670	Hill, Marguerite S.	7,772
Coakley, Cornelius G.	35,706	Hirschewitz, Blanche M.	86,544
Coakley, Cornelius G., Memorial.....	508,115	Honic, Louis M.	24,266
Coakley, Louise Perry.....	368,657	Ingenthaler, May A., Memorial Bed	30,511
Colgate, Hannah, Memorial.....	85,907	Institute of Ophthalmology, The.....	4,822,705
Collins, Perry McDonough.....	775,771	Ives, Helen Douglas	159,720
Columbia University for Vanderbilt Clinic and Sloane Hospital.....	1,933,116	James Foundation of New York	656,842
Commonwealth, The, Fund, for Eye Institute	1,002,839	Jesup, Morris K. and Maria DeWitt	141,306
Cook, William W.	139,806	Johnston, Andrew, Memorial Room	57,329
Cooper, Charles P. and Leonora P....	53,742	Jones, David, Memorial	423,920
Cragin Fund	97,246	Jones, Margarette A.	234,929
Davis, Isabel G.	1,109,141	Keller Memorial	707
Delano, Moreau	5,652	Kennedy, John Stewart	1,368,163
Department of Surgery	81,750	Kinnicutt, The G. Herman, Flower	7,066
Dodge, The Cleveland H.	438,757	Knapp, The Herman Memorial Eye Hospital Endowed Bed	90,737
Dortic Memorial	139,927	Kreisler, Harriet and Fritz	305,446
Dows, Mrs. David.....	10,880	Krumb, Henry	29,278
Dows, Margaret E.	7,575	Lattimer, Dr. John K.	75,976
Educational and Scientific Work.....	403,469	Lindley, Erasmus C.	59,095
Eichner, Joseph Herman and Hannah, in Memory of.....	12,118	MacMillin, Isabel, Memorial	1,906,693
Eidlitz, Otto M.	581,104	Maloy, The Frank and Selena, Memorial	29,548
Eidlitz, Robert J.	262,182	Martin, Frederick Townsend	14,130
Endowed Bed	3,032,292	Maxwell, Anna C., Memorial Library	10,130
Endowed Bed — Research	255,277	McCosh, Dr. Andrew J., Memorial	141,578
Eye Pathology	10,330	McCready, Jeanne Campbell	142,232
Faulkner, The Edward Daniels Memorial for Study and Treatment of Arthritis	141,306	McGuire, Mary Madison	349,312
Feldman, Irving J.	25,781	Medical Laboratory Development Endowment	272,913
Fiske Fund	147,293	Medical Scientific	502,687
FitzGerald, Frederick H. and Josephine F.	191,823	Milbank, Dunlevy	1,163,256
Flagler, Alice Manderlick.....	351,866	Miller, James, Endowed Room	85,904
Foot, Edwin Bancroft	248,627	Miller, Margaret G.	73,049
Ford, George W. and Eliza Lawson....	467,599	Montfort, Barret, Memorial, Scholarships	43,717
Fowler, Dr. Edmund P., Memorial.....	5,254	Morgan, Edward M., Endowed Beds	54,328
Fracture Endowment Fund	11,762	Morgenstern, Morris and Celia, Research	13,986
Fremstad, Anna Olivia.....	165,533	Nathan, Garfield Arthur	308,066
		Ophthalmological Research	103,736
		Ottman, for Cancer Research	39,555

EXHIBIT E (*Continued*)ENDOWMENT FUNDS—*Continued*

	Market Value December 31, 1969
Parkin, Alice Temple.....	59,495
Prostate, Fund for Research.....	13,289
Quick, The Walter R.....	20,725
Research and Development in Anesthesiology	273,113
Research and Development in Department of Medicine.....	62,407
Richards-Cournand Library.....	11,038
Rogers, Henry H., Memorial.....	39,409
Sage, Dean, Memorial.....	39,922
Sage, Dean, Scholarship.....	9,174
Sage, Russell and Margaret Olivia, Memorial	548,104
School of Nursing.....	289,452
Secor, Mary E.....	48,714
Sherry, The Bertha, Memorial.....	918,322
Sidman Trust	1,515
Sinclair, The Francis MacDonald, Endowed Room	53,440
Sinclair, The Jennie Hankinson, Endowed Room	53,440
Sloane Hospital	1,106,794
Sloane Hospital Babies' Alumni.....	34,176
Sloane Hospital Research.....	35,377
Sloane, The William, Memorial.....	912,152
Smith, Henrietta H., Periodical.....	1,139
Society of the Alumni of Presbyterian Hospital	3,682
Soria, Henry J.....	108,908
Squier Clinic	99,779
Squier Clinic Fellowship and Resident.	60,796
Stein, Jules	37,663
Stevenson, Dr. Thomas W., Memorial.	29,099
Stilson, Ellen J. and Minnie	27,422
Stone, William Ridgley, Memorial....	98,621
Sturges, Frederick, Jr., Scholarship....	64,418
Surgical Cancer Research.....	6,778
Surgical Fellowship	84,783
Taylor, Dr. Alfred S., Memorial.....	24,511
Taylor, Sarah A. Hard, Endowed Room	62,172
Terry, John T., in Memory of.....	57,606
Thacher, Frances Lake, Memorial....	19,878
Tod, J. Kennedy, Memorial.....	141,451
Tolfree, The Caroline O. and James E., Memorial	222,376
Urological Service Research.....	106,280
Valentine, Isaac E., Memorial.....	795,864
Van Norden, Kathryn L.....	3,687
Vanderbilt Clinic	221,577
Walden, Julia Carroll.....	200,584
Webster, Dr. Jerome P., Library of Plastic Surgery	76,237
Weinberg, Ruth F.....	200,319
Weinberg, The Sidney J., Employees Educational Aid	118,538
Weinman, Moses	7,575
Weisl, Alice	451,703
Welles, Frances Swan.....	14,130
Westlake, Emory H. and Caroline B..	39,844
Wheeler, The Dr. John M., Memorial.	105,378
Williams, William	476,274
	<hr/> 66,328,409
THE BABIES HOSPITAL:	
Cleft Palate Cases.....	10,094
Cribside Social Service Committee.....	18,128
Educational Therapy	1,413
Eichner, Joseph Herman and Hannah, in Memory of.....	12,118
Endowed Bed	58,531
General Endowment	12,859
Harkness, Edward S.....	1,695,359
Harkness, Edward S., Educational and Scientific	847,839
Harkness, Mary Stillman, Memorial Endowment	336,147
Kimball, Reuel B.....	81,587
Lambert, Dr. Charles I., Memorial.....	12,859
Pratt, Samuel	56,216
Rathbone, R. Bleeker.....	21,196
Rumson Fund	28,925
Urological Service Research.....	5,555
Videre, Leontine, Foundation.....	14,090
Wilcox, Herbert B., Memorial.....	4,460
	<hr/> 3,217,376
NEUROLOGICAL INSTITUTE:	
Blair Memorial	4,419
Endowed Bed — Research	217,458
Neurological Institute Auxiliary.....	10,805
Ogilvie, Clinton, Memorial.....	14,088
Schlesinger, Dr. Edward B.....	65,758
Zabriskie, Dr. Edwin G., Memorial	140,457
	<hr/> 452,985
NEW YORK ORTHOPEDIC HOSPITAL:	
Bridgman, Statira	3,533
Carroll, Dr. Robert E., Research.....	15,480
Endowed Bed	876,587
Farrell, Dr. Benjamin P., in Memory of	10,165
General Endowment	1,177,449
Hallock, Dr. Halford, Fellowship.....	16,099
Hibbs, Russell A., Memorial Library..	76,043
Hurst, The Thomas D. and Kate.....	7,066
Kane, Annie C., Fellowship.....	1,413,063
Lantzounis, Dr. Leonidas A., Fellowship	15,396
Orthopedic Surgery Endowment.....	194,645
Rathbone, R. Bleeker	21,196
Smith, Dr. Alan DeForest, Lectureship	7,998
Tower, Mary T., in Memory of.....	43,196
Watson, Emily A.....	3,535,845
White, Emily Vanderbilt.....	27,986
Willard, Mary Livingston.....	7,066
	<hr/> 7,448,813
TOTAL ENDOWMENT FUNDS.....	<hr/> \$77,447,583
TRUSTS REMITTING INCOME TO THE HOSPITAL	
Trust	Market Value December 31, 1969
Cook, William W.....	\$ 199,667
Danziger, Matilda	77,816
Gould, Edwin	15,363
Jackson, Peter A. H.....	405,159
Strong, W. E. S.....	593,399
Swan, Helen M. W.....	1,124,823

ACCOUNTANT'S OPINION

**THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:**

We have examined the balance sheet of The Presbyterian Hospital in the City of New York as of December 31, 1969, the related statements of operating income and expenses and of investment income, and summary of fund changes for the year then ended, and the supplemental schedule of endowment funds. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements and supplemental schedule present fairly the financial position of the Hospital at December 31, 1969 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HASKINS & SELLS

Certified Public Accountants

New York

February 9, 1970

REPORT OF THE AUDITING COMMITTEE

**TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:**

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board has chosen, with your approval, the firm of Haskins & Sells, as independent certified public accountants, to make an examination of the financial statements of The Presbyterian Hospital in the City of New York for 1969.

We submit herewith after due consideration by this Committee, an opinion of Haskins & Sells dated February 9, 1970 relating to the Corporation's balance sheet as of December 31, 1969, the related statements of operating income and expenses and of investment income, and summary of fund changes for the year then ended, and the supplemental schedule of endowment funds. Your Committee recommends that the opinion and financial statements be accepted and approved.

JOHN A. GIFFORD, *Chairman*
JOHN A. HILL
DORRANCE SEXTON
JAMES W. WALKER
ROBERT WINTHROP

Auditing Committee

New York

February 19, 1970

EXHIBIT F

**GROUP RETIREMENT PLAN ESTABLISHED BY
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK**

The retirement benefits provided by the Hospital under its Group Retirement Plan are partly provided by a Trust Fund established with the Morgan Guaranty Trust Company of New York and partly insured by the Travelers Insurance Company. The amounts set aside for retirement benefit purposes, which are not a part of the assets of the Hospital, aggregated \$14,268,553 at December 31, 1969. Payments to the fund during 1969 were included in expense. In accordance with the Hospital's undertaking under the Group Retirement Plan the amounts already set aside are sufficient to provide for all retirement benefits to which employees now retired and employees now eligible to retire at their own request are or would upon retirement be entitled under the Plan. In addition, they include provision for that portion of future retirement benefits to employees not now eligible for retirement at their own request, which has been funded through December 31, 1969, under the systematic program followed by the Hospital in financing such benefits.

Following is the Trustee's report for the year ended December 31, 1969 on the Retirement Fund Trust established by the Hospital:

Assets in Fund — January 1, 1969.....	\$ 7,553,596
Payments to Fund.....	2,053,196
Net Income from Investments including Net Profit on Investments Disposed of.....	<u>697,249</u>
	10,304,041
Disbursements for Retirement Benefits.....	304,685
Assets in Fund — December 31, 1969.....	<u>\$ 9,999,356</u>
Consisting of:	<i>Book Value*</i>
Industrial, Railroad, Public Utilities and Miscellaneous Bonds.....	\$ 1,912,490
Government Mortgages	119,957
Preferred Stocks	4,333
Common Stocks	5,780,841
Commingled Pension Trust Funds:	
Excluding Common Stocks.....	49,961
Mortgage — Real Property	1,021,275
Special Situation Investments — Convertibles.....	607,670
Special Situation Investments — Equities	457,198
Cash	45,631
	<u>\$ 9,999,356</u>

* The cash and approximate market value of securities held as of December 31, 1969 totalled \$11,511,576.

MORGAN GUARANTY TRUST COMPANY OF NEW YORK,
Trustee

By F. P. SLOAT, JR.
Assistant Trust Officer

Following is a summary of the Retirement Fund Trust and the Travelers Insurance Company reserves at December 31, 1969:

Retirement Fund Trust — Morgan Guaranty Trust Company of New York, Trustee.....	\$ 9,999,356
Travelers Insurance Company Reserves for Annuities Purchased.....	4,269,197
	<u>\$14,268,553</u>

STATISTICS

Year 1969

	Bed Complement (*)	Admissions	Patient Days Care
PRIVATE:			
Presbyterian Hospital (Harkness Pavilion).....	210	5,004	74,904
Babies Hospital	3	232	645
Edward S. Harkness Eye Institute.....	19	725	5,120
Neurological Institute	63	1,068	21,600
Sloane Hospital	24	931	5,199
Total Private	<u>319</u>	<u>7,960</u>	<u>107,468</u>
SEMI-PRIVATE:			
Presbyterian Hospital and Sloane Hospital:			
All services (Harkness).....	95	3,116	31,345
Dermatology	8	78	1,466
Gynecology	13	387	4,363
Medicine (9 beds reclassified ward — March 31, 1969).....		30	752
Obstetrics	29	910	4,492
Orthopedic	55	903	17,393
Otolaryngology	21	1,355	5,628
Surgery	41	829	13,112
Urology	31	659	9,208
Babies Hospital	48	1,589	12,490
Edward S. Harkness Eye Institute.....	53	2,300	16,002
Neurological Institute	89	817	24,290
Total Semi-Private	<u>483</u>	<u>12,973</u>	<u>140,541</u>
WARD:			
Presbyterian Hospital and Sloane Hospital:			
Admitting	14	830	3,401
Dermatology (8 beds reclassified semi-private — May 4, 1969).....		29	834
Gynecology	35	793	8,659
Medicine	101	1,718	31,148
Metabolism	10	105	2,124
Obstetrics	83	4,294	22,254
Orthopedic	67	1,227	19,542
Otolaryngology	12	491	2,736
Surgery	90	1,977	26,355
Urology	36	646	9,137
Babies Hospital (including neonatal special care unit of 23 incubators).....	147	2,721	36,298
Edward S. Harkness Eye Institute.....	28	909	6,695
Neurological Institute	98	1,163	28,738
Total Ward	<u>721</u>	<u>16,903</u>	<u>197,921</u>
Total	<u>1,523</u>	<u>37,836</u>	<u>445,930</u>
MARY HARKNESS UNIT.....	<u>55</u>	<u>664</u>	<u>10,879</u>
Total	<u>1,578</u>	<u>38,500</u>	<u>456,809</u>
NEWBORNS (Sloane Hospital):			
Private beds	24	586	3,228
Semi-private and Ward beds.....	90	3,722	18,810
Total	<u>114</u>	<u>4,308</u>	<u>22,038</u>

(*) As of December 31

OUT-PATIENT DEPARTMENT STATISTICS

Summary of Patients Treated:	1969	1968
Number of patients treated.....	<u>59,668</u>	<u>63,531</u>
Number of visits:		
Free	36,944	30,088
Pay	<u>353,559</u>	<u>366,878</u>
Total	<u>390,503</u>	<u>396,966</u>
Average visits per work day.....	<u>1,531</u>	<u>1,576</u>

Attendance Statistics:	New to Clinics	Revisits	Total Visits
Dermatology	6,391	16,750	23,141
Emergency and Admitting Wards.....	26,092	18,222	44,314
Group Clinic	5,630	18,893	24,523
Medicine	5,957	30,783	36,740
Neurology	2,388	13,850	16,238
Obstetrics and Gynecology.....	14,221	33,290	47,511
Ophthalmology	3,485	22,003	25,488
Orthopedic	10,124	21,471	31,595
Otolaryngology	5,143	16,964	22,107
Pediatrics	4,519	26,116	30,635
Physical Medicine and Rehabilitation.....	1,239	13,700	14,939
Psychiatry	1,611	8,532	10,143
Surgery	24,080	27,579	51,659
Urology	1,740	9,730	11,470
Total	<u>112,620</u>	<u>277,883</u>	<u>390,503</u>

PERSONNEL STATISTICS

	On Duty December 31	
	1969	1968
Administration	12	12
Assistant Secretary-Treasurer	94	88
Comptroller	170	166
Public Interest	26	20
Mary Harkness Unit.....	32	32
Non-professional services:		
Buildings and grounds.....	651	643
Food service	336	336
Personnel and protective.....	104	93
Other non-professional services.....	151	167
Professional services:		
Nursing	1,652	1,664
Professional staff, doctors' offices and research.....	436	433
Special services	750	623
Vanderbilt Clinic and other.....	378	361
Total	<u>4,792</u>	<u>4,638</u>
Students	247	284
Volunteer Workers	418	358

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL
(Including Cribside Social Service Committee)

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1969 and 1968

	1969	1968
Balance, January 1.....	\$14,894.70	\$21,459.23
Receipts :		
Membership dues	1,080.00	900.00
Interest on investments.....	994.61	933.00
Greater New York Fund.....	12,779.00	17,036.00
United Hospital Fund:		
Free Care Distribution.....	8,335.00	9,504.00
Direct Benefit	9,508.00	7,172.00
Special Projects:		
Everybody's Thrift Shop.....	21,529.10	18,478.36
Sewing Class	490.00	457.00
Donations	3,145.00	1,535.00
Payments by patients for convalescent care, etc.....	220.00	878.60
Total Receipts	58,080.71	56,893.96
	72,975.41	78,353.19
Disbursements:		
Used for the care of Ward and Clinic patients.....	9,508.00	7,172.00
Emergency Nursing Fund.....	6,000.00	6,000.00
Staff Development Fund.....	607.00	400.00
Recreational Therapy	5,500.00	4,500.00
Pediatric Psychiatric Clinic.....	1,500.00	1,500.00
Volunteers	500.00	500.00
Salaries	29,537.67	35,061.65
Administration	526.22	913.82
Social Service Expenditures for Patients:		
Appliances	1,104.12	773.80
Clothing	424.10	221.81
Special diets	289.08	167.30
Transportation of patients.....	522.25	389.00
Other	415.11	455.79
Special Projects:		
Sewing Class expenditures.....	24.04	25.44
Thrift Shop expenditures.....	907.07	908.42
Summer Camp Expenditures.....	3,241.35	4,200.00
Miscellaneous	325.11	269.46
Total Disbursements	60,931.12	63,458.49
Balance, December 31.....	\$12,044.29	\$14,894.70

PATRICIA MUNN, *Treasurer*

NEUROLOGICAL INSTITUTE AUXILIARY

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1969 and 1968

	1969	1968
Balance, January 1.....	<u>\$29,556.64</u>	<u>\$33,957.07</u>
Receipts:		
Membership dues	440.00	390.00
Donations	18,065.82	12,690.00
United Hospital Fund:		
Free Care Distribution.....	7,479.00	8,526.00
Direct Benefit	9,340.00	8,378.00
Greater New York Fund.....	11,466.00	15,284.00
Everybody's Thrift Shop.....	15,687.06	23,730.06
Proceeds from Benefit.....		19,753.21
Payments by patients of advances and loans.....	651.00	530.00
Total Receipts	<u>63,128.88</u>	<u>89,281.27</u>
	<u>92,685.52</u>	<u>123,238.34</u>
Disbursements:		
Social service salaries.....	26,894.44	30,575.03
To Neurological Institute for:		
Care of Clinic and Ward patients.....	9,340.00	8,378.00
Library	5,566.98	5,237.77
Social Service Staff Department.....		2,050.00
Social Service Scholarships.....	2,872.60	2,650.00
Emergency Nursing Fund		3,000.00
Emergency Nursing Endowment Fund.....		5,000.00
Volunteer service	1,900.00	1,900.00
Recreational therapist	5,004.04	1,842.63
Summer Camp Program Endowment Fund.....		5,000.00
Advances to patients for summer therapeutic care and miscellaneous.....	651.00	530.00
Summer therapeutic care.....	15,945.25	15,840.22
Benefit expenses		7,056.56
Chronic care	85.50	8.00
Medical relief	694.54	1,068.15
Staff travel, field and conference.....	436.72	214.95
Everybody's Thrift Shop.....	125.29	534.00
Miscellaneous, postage, telephone and publication.....	2,669.83	2,796.39
Total Disbursements	<u>72,186.19</u>	<u>93,681.70</u>
Balance, December 31.....	<u>\$20,499.33</u>	<u>\$29,556.64</u>

NANCY FESSENDEN, Treasurer

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1969 and 1968

	1969	1968
Balance, January 1.....	<u>\$20,105.87</u>	<u>\$23,147.78</u>
Receipts:		
Donations	8,603.80	8,767.76
Investment income used in Recreational Therapy.....	1,997.55	1,873.82
United Hospital Fund:		
Direct Benefit	15,010.00	8,789.00
United Hospital Fund and Greater New York Fund.....	8,970.00	4,000.00
Total Receipts	<u>34,581.35</u>	<u>23,430.58</u>
	<u>54,687.22</u>	<u>46,578.36</u>
Disbursements:		
Recreational therapist salary.....	14,264.56	12,044.35
Other recreational therapy expenses.....	583.10	468.70
To Presbyterian Hospital for:		
Care of Ward and Clinic patients.....	15,010.00	8,789.00
Library	2,156.04	2,045.91
Occupational Therapy Aides.....	1,657.66	1,399.04
Volunteer service	1,100.00	1,100.00
Miscellaneous	803.50	625.49
Total Disbursements	<u>35,574.86</u>	<u>26,472.49</u>
Balance, December 31.....	<u>\$19,112.36</u>	<u>\$20,105.87</u>

MARTHA R. WALLACE, Treasurer

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1969 and 1968

	1969	1968
Balance, January 1.....	<u>\$20,567.01</u>	<u>\$ 8,379.99</u>
Receipts:		
Membership dues	793.00	793.00
United Hospital Fund:		
Free Care Distribution.....	4,700.00	5,410.00
Direct Benefit	19,209.00	26,977.00
Greater New York Fund.....	7,207.00	9,697.00
Donations	355.00	2.50
Stuyvesant Square Thrift Shop.....	<u>27,295.26</u>	<u>30,516.75</u>
Total Receipts	<u>59,559.26</u>	<u>73,396.25</u>
	<u>80,126.27</u>	<u>81,776.24</u>
Disbursements:		
To Presbyterian Hospital:		
Care of Ward and Clinic patients.....	19,209.00	26,977.00
Emergency Nursing Fund.....	1,000.00	5,580.00
Monitoring machines	6,059.63	6,031.40
Occupational Therapy	12,779.37	11,529.54
Library	7,700.00	7,200.00
Volunteer service	7,900.77	2,763.97
Recreational Therapy		
Social Service:		
Television sets for patients.....	2,073.00	
Social Service Department.....	800.00	
Social Service Special Care Needs.....	500.00	
Student Nurse Scholarship Fund.....	500.00	
Anna Ball Kneeland Memorial Fund for Staff Development in Social Service..	2,500.00	740.00
Emily Webster Fund.....	1,000.00	
Eye Institute	500.00	
Miscellaneous	<u>767.97</u>	<u>387.32</u>
Total Disbursements	<u>63,289.74</u>	<u>61,209.23</u>
Balance, January 1.....	<u>\$16,836.53</u>	<u>\$20,567.01</u>

JEAN S. LENESS, Treasurer

ANNA BALL KNEELAND MEMORIAL FUND
FOR STAFF DEVELOPMENT IN SOCIAL SERVICE
For the Years 1969 and 1968

	1969	1968
Balance, January 1.....	<u>\$(6.07)</u>	<u>\$ 792.33</u>
Receipts:		
Women's Auxiliary of The Presbyterian Hospital.....	2,500.00	740.00
Other	40.00	
Total Receipts	<u>2,540.00</u>	<u>740.00</u>
	<u>2,533.93</u>	<u>1,532.33</u>
Disbursements:		
Seminar and Staff Development Sessions.....	522.40	906.00
Social Service Case Worker Assistant.....		624.00
Miscellaneous		8.40
Total Disbursements	<u>522.40</u>	<u>1,538.40</u>
Balance, December 31.....	<u>\$ 2,011.53</u>	<u>\$(6.07)</u>
() Overdraft.		

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

BALANCE SHEET

December 31, 1969 and 1968

ASSETS

	December 31	
	1969	1968
CURRENT FUNDS ASSETS:		
Cash	\$ 9,709	\$ 98,237
Savings accounts		1,490,000
Bankers acceptances, commercial paper and bank certificates of deposit.....	1,588,016	300,000
Bonds and stocks — at cost or contributed value (quoted market value — 1969, \$874,260).....	873,064	542,859
Interest accrued and dividends receivable.....	47,427	50,095
TOTAL CURRENT FUNDS ASSETS.....	2,518,216	2,481,191
ENDOWMENT FUNDS ASSETS:		
Cash	1,393	7,405
Bonds and stocks — at cost or contributed value (quoted market value — 1969, \$3,184,929).....	3,743,365	3,725,676
TOTAL ENDOWMENT FUNDS ASSETS.....	3,744,758	3,733,081
TOTAL	\$6,262,974	\$6,214,272

FUNDS AND LIABILITIES

CURRENT FUNDS AND LIABILITIES:		
Accrued expenses	\$ 5,823	\$ 14,328
Special expendable funds.....	2,212,754	2,234,759
General fund	299,639	232,104
TOTAL CURRENT FUNDS AND LIABILITIES.....	2,518,216	2,481,191
ENDOWMENT FUNDS	3,744,758	3,733,081
TOTAL	\$6,262,974	\$6,214,272

NOTES:

The above corporation was established on January 21, 1960 to obtain funds to be used for the joint educational, scientific and charitable purposes now carried on by The Presbyterian Hospital in the City of New York and The Trustees of Columbia University in the City of New York through the Columbia-Presbyterian Medical Center.

The accompanying financial statements do not include amounts contributed directly to Columbia University or The Presbyterian Hospital in the City of New York for the development of the Columbia-Presbyterian Medical Center.

ACCOUNTANTS' OPINION

COLUMBIA-PRESBYTERIAN
MEDICAL CENTER FUND, INC.

We have examined the balance sheet of Columbia-Presbyterian Medical Center Fund, Inc. as of December 31, 1969 and the related summary of fund changes for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedure as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and summary of fund changes present fairly the financial position of the Fund at December 31, 1969 and, in summarized form, the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

New York
March 2, 1970

HASKINS & SELLS
Certified Public Accountants

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1969 and 1968

GENERAL FUND

	December 31	
	1969	1968
Balance, January 1.....	<u>\$ 232,104</u>	<u>\$ 412,723</u>
Add:		
Unrestricted contributions	56,725	89,887
Investment income	20,002	14,078
	<u>76,727</u>	<u>103,965</u>
Deduct — Fund raising expenses for Columbia-Presbyterian Medical Center development program	59,387	56,576
Excess of unrestricted contributions and investment income over expenses.....	17,340	47,389
Total	<u>249,444</u>	<u>460,112</u>
Add:		
Grants and Transfers — Net:		
Grant to Presbyterian Hospital for construction purposes.....	(487,057)	
Transfers from expendable funds.....	50,195	259,049
Net	<u>50,195</u>	<u>(228,008)</u>
Balance, December 31.....	<u>\$ 299,639</u>	<u>\$ 232,104</u>

SPECIAL EXPENDABLE FUNDS

(For Construction, Faculty Salaries and Other Purposes)

Balance, January 1.....	\$2,234,759	\$2,087,953
Add:		
Contributions	163,479	694,828
Investment income	321,918	284,575
	<u>485,397</u>	<u>979,403</u>
Total	<u>2,720,156</u>	<u>3,067,356</u>
Deduct:		
Grants to:		
Presbyterian Hospital:		
For construction purposes.....	193,336	415,342
For faculty salaries	11,703	22,644
Columbia University:		
For construction purposes.....	147,739	
For fellowships	45,228	20,809
For faculty salaries	59,201	114,753
Transfers to general fund.....	50,195	259,049
	<u>507,402</u>	<u>832,597</u>
Balance, December 31.....	<u>\$2,212,754</u>	<u>\$2,234,759</u>

ENDOWMENT FUNDS

Balance, January 1.....	\$3,733,081	\$3,729,595
Add:		
Contributions	11,677	3,486
Balance, December 31.....	<u>\$3,744,758</u>	<u>\$3,733,081</u>

**COLUMBIA UNIVERSITY-PRESBYTERIAN HOSPITAL
SCHOOL OF NURSING ALUMNAE ASSOCIATION, INC.**

STATEMENT OF ASSETS, LIABILITIES AND FUNDS

December 31, 1969 and 1968

	ASSETS	
	1969	1968
Capital Funds — securities and cash.....	\$1,178,781.44	\$1,154,646.17
Operating Funds — securities and cash	26,306.40	19,186.72
Total Assets	<u>\$1,205,087.84</u>	<u>\$1,173,832.89</u>

	LIABILITIES	
	1969	1968
Capital Fund Reserves:		
General fund	\$ 49,972.11	\$ 41,215.31
Benefit fund	249,573.69	244,611.87
Pension fund	745,532.35	740,648.02
Helen Young Memorial fund	6,052.56	6,053.52
Scholarship funds:		
Josephine C. Brown fund.....	2,077.72	1,539.27
Janet B. Christie fund.....	3,703.20	3,453.74
Helen Cunningham fund.....	2,746.57	2,066.25
M. Elizabeth Deans Howell fund	2,665.12	2,062.36
Dorothy DeGraff Keim fund	3,040.00	2,372.45
Emma B. Kennedy fund.....	44,000.84	44,007.70
Ethel Burnham Kernohan fund	2,039.95	1,552.15
Memorial fund, '20.....	5,227.83	5,228.64
June Moore fund.....	2,132.06	1,512.53
Sarah C. Nadel fund.....	1,272.01	908.24
Richard Williams Walsh fund.....	3,383.82	2,732.92
Ruth C. Williams fund.....	6,168.74	5,480.64
Helen Young fund.....	49,192.87	49,200.56
Total capital fund reserves.....	<u>1,178,781.44</u>	<u>1,154,646.17</u>
Operating Funds Reserves.....	26,306.40	19,186.72
Total Liabilities	<u>\$1,205,087.84</u>	<u>\$1,173,832.89</u>

SUMMARY OF RECEIPTS AND DISBURSEMENTS

Cash on Hand, January 1.....	\$ 55,529.00	\$ 20,044.76
Receipts:		
Sale of securities	78,154.52	87,628.08
Investment income	66,010.56	60,499.22
Donations	13,145.49	12,971.99
Dues and initiation fees	23,184.52	24,606.50
School of Nursing — 75th Anniversary Fund	4,081.45	
Loans repaid, etc.....	3,105.58	4,392.76
Total Receipts	<u>183,600.67</u>	<u>194,180.00</u>
Disbursements:		
Purchase of securities	127,689.27	87,397.51
Clerical expense and fees	10,749.00	10,189.00
Pensions and benefits paid.....	44,060.00	36,950.00
Scholarships granted	6,500.00	4,950.00
Printing, stationery and postage.....	7,012.96	4,907.61
School of Nursing — 75th Anniversary Fund	3,387.38	
Miscellaneous	5,688.92	10,914.26
Total Disbursements	<u>201,700.15</u>	<u>158,695.76</u>
Balance on Hand, December 31.....	<u>\$ 37,429.52</u>	<u>\$ 55,529.00</u>

MARGARET WELLS, Treasurer

Endowed Beds and Rooms

(1) A gift of \$10,000 shall entitle the donor to nominate a patient to use and occupy one bed in the common wards of the Hospital free of charge (except for special service) for not more than ninety days in any one year.

The donor may at the time of making the gift appoint to another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only: —

(a) During the life of the person having the right to nominate, if such right is in an individual.

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

(2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment and discharge of patients.

(3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the objects for which the Hospital was established and is maintained.

(4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

A gift of \$10,000 shall entitle the donor to establish as a permanent memorial one memorial endowed bed for research purposes in a ward of the Hospital to be used and occupied by patients free of charge, except for special service.

The President of the Medical Board shall, subject to the approval of the Executive Vice President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes for not more than ninety days in any one year for a period of fifteen years, subject to all rules and regulations governing the admission, treatment and discharge of patients. This privilege shall be assigned to the persons occupying these respective offices (President of the Medical Board and Executive Vice President of the Hospital) at the time the nomination is made.

Endowed Beds and Rooms

Presbyterian Hospital

1868 Mary J. Gelston

1870 Henrietta A. Lenox (2 Beds)
Washington R. Vermilyea
A. R. Wetmore

1871 Estate of John Laurie
Mary Ann Parish

1872 William Earl Dodge
John T. Johnston
Otis D. Swan
Henry Young (2 Beds)

- 1873 James Brown (2 Beds)
John R. Ford
Jonathan Sturges
- 1878 James G. and Henry G. deForest, in memory of
Lockwood deForest Woodruff, M.D.
- 1880 William C. Rhinelander
- 1881 Jennet L. and Robert L. Belknap, in memory of
Aaron B. Belknap
Fifth Avenue Presbyterian Church
Henry B. Hyde, in memory of his son,
Henry B. Hyde, Jr.
John Stewart Kennedy
Frederick and Henry G. Marquand
Edwin D. Morgan (3 Beds)
Mary L. Sheafe
John L. Proudfit
- 1882 Heber R. Bishop (3 Beds)
Mrs. Robert L. Stuart, in memory of her father,
Robert McCrea
Edwin D. Morgan
Mrs. Moses Taylor
- 1883 Frederick Billings
Reformed Protestant Dutch Church of the
City of New York
- 1884 Rev. Nathaniel W. Conkling, D.D.
West Presbyterian Church, to be known as the
"Faith Presbyterian Church Bed"
Madison Square Presbyterian Church, in memory
of George W. Lane
- 1885 Brick Presbyterian Church, in memory
of Dr. John G. Adams
Richard Irvin
- 1886 Frederick Baker, in memory of
Sarah Pyewell Baker
Estate of Dr. Edward Langdon Beadle
Brick Presbyterian Church, in memory of
Miss Ann Adams
Fourth Avenue Presbyterian Church Bed by Peter
Cumming, in memory of Francis P. Schoals
George E. Dodge
Horace F. Hutchinson, in memory of
Ellen B. Schoals
Mr. and Mrs. William D. Sloane, in memory of
their son, William D. Sloane, Jr.
Henry S. Wilson, in memory of his son,
Harry H. Wilson
- 1887 Fifth Avenue Presbyterian Church
- 1888 Broadway Tabernacle Society
Samuel Inslee, in memory of Kate J. Inslee
- 1889 John Sloane, in memory of his mother,
Euphemia Sloane
- 1890 Isaac V. Brokaw, in memory of Ernest B. Brokaw
Sidney Dillon, in memory of Hannah Dillon
Ambrose K. Ely
Josiah M. Fiske
Oliver Burr Jennings

- Mrs. John Stewart Kennedy
 Amelia Kerr
 Fourth Presbyterian Church by Estate of
 Robert Marshall
 Elizabeth D. and Emily M. Wheeler, in memory
 of James Boorman, to be known as
 "The Davenport Bed"
- 1891 Hector C. Havemeyer Bed, by
 Sarah A. Havemeyer, in memory of her son
 Estate of Thomas Hope
 Mrs. A. R. Van Nest, in memory of her husband,
 Abram R. Van Nest
- 1892 John Stewart Kennedy, in memory of his niece,
 Emma Stewart Baker
 Alexander Maitland, in memory of his mother,
 Mary C. Maitland
- 1893 Maria S. Auchincloss, in memory of her husband,
 Edgar S. Auchincloss
 Frances T. Lord, in memory of her husband,
 George deForest Lord
 Presbyterian Church on University Place
 Presbyterian Home for Aged Women
 Margaret A. Sinclair, in memory of her parents,
 Mr. and Mrs. James Sinclair
 West Presbyterian Church
 Young Men's Christian Association
- 1895 Matilda A. Brown, in memory of her son,
 H. Auchincloss Brown
 Mary Harrison
 Mrs. Clarence M. Hyde, in memory of her mother,
 Rebecca Babbitt
 John Stewart Kennedy, in memory of
 Mrs. Robert L. Stuart
 Mrs. James T. Murray, in memory of her husband,
 James T. Murray
- 1896 Anthony Dey, in memory of Joseph G. and
 Eliza D. Scott
 Jane Hope
 Esther J. Jennings, in memory of her husband,
 Oliver B. Jennings
- 1897 Mrs. Frances E. Baker, in memory of her father,
 James Rich Steers
 William Smith Brown
 Helen Miller Gould, in memory of her parents,
 Mr. and Mrs. Jay Gould
 Margarette E. and Susan D. Griffith, in memory of
 their father, Griffith W. Griffith
 Mary J. Griffith, in memory of her husband,
 Griffith W. Griffith
 Rachael L. Kennedy, in memory of her mother,
 Mrs. Rachael C. Kennedy
 Annie S. Paton, in memory of her husband,
 William Paton
 Charlotte H. Skidmore, to be known as
 "The William L. Skidmore Bed"
- 1898 Brick Presbyterian Church
 First Presbyterian Church
 Mrs. Stephen V. Harkness, in memory of her
 daughter, Florence Harkness
 Jane Hope, in memory of her mother,
 Grace Corric Hope
 John Stewart Kennedy, in memory of
 Rev. William G. Schaufller, D.D., LL.D.
- Mrs. Elliott F. Shepard, in memory of her
 daughter, Florence Vanderbilt Shepard
 Mrs. Elliott F. Shepard, in memory of her
 daughter, Marguerite Vanderbilt Shepard
- 1899 William W. Cole, in memory of his mother,
 Mary A. Cole
 Estate of William Whitewright, in memory of his
 father, William Whitewright, "The Whitewright
 Beds" (10 Beds)
- 1900 Emily B. Hopkins, in memory of her husband,
 Moses Hopkins, "Moses Hopkins Memorial"
 Donald MacKay, in memory of his children,
 Edith Winslow and Walter Wise MacKay
 Caroline L. Macy, in memory of her daughter,
 Mary M. K. Willets
 Estate of Alexander M. Proudfit, to be known as
 the "John McLean Proudfit Bed"
 Laura Roome, in memory of her sons,
 Harry and Alfred Roome
 Martha L. St. John, in memory of her mother,
 Sarah Ward
 Nathaniel Whitman
- 1901 Julia Billings, in memory of her husband.
 Frederick Billings
 Camilla L. Edwards, in memory of her husband,
 Walter Edwards
 Andrew J. Garvey, in memory of his mother,
 Elizabeth Jeffries Garvey (2 Beds)
 George Lauder
 Charles H. Marshall
 John E. Parsons, in memory of his children,
 E.L.P., K.M.P., and R.M.P.
 Justine Adele Stafford, in memory of her father,
 Justin A. Bliss
- 1902 Robert Graham Dun
 Margaret J. Plant, in memory of her brother,
 Simon Loughman
- 1903 Heber R. Bishop
 Laura Currier
 Mrs. Francis B. Harrison
 Julia J. MacCartee, in memory of her husband,
 Robert MacCartee
 Madison Avenue Reformed Church
 Adele Berry Sloane, in memory of her father,
 Abraham J. Beery, M.D.
 Justine Adele Stafford, in memory of her mother,
 Evelina C. Bliss
 John T. Terry
- 1904 Virginia E. Fowler, in memory of
 Clarence E. Fowler
 Susan Bevier
 Mrs. William Starr Miller
 Josephine Penfold, in memory of
 Dr. Edward Livingston Trudeau, Jr.
 Peter Reid, in memory of his wife,
 Jane Watson Reid
 Francis A. Palmer
- 1905 Frederick G. Bourne
 Mr. and Mrs. Albert H. Gallatin
 Helen C. Inslee, in memory of her husband,
 Samuel Inslee
 Titus B. Meigs, in memory of his son,
 Titus B. Meigs, Jr.

- Mrs. James T. Murray, in memory of
Rev. John Hall, D.D., LL.D.
- Sarah J. Parsons, in memory of her husband,
Charles Parsons
Presbyterian Church on University Place
- 1906 Maria L. Campbell, in memory of
Henry Pearall Campbell
- Susan W. Duncan, in memory of her husband,
John P. Duncan
- Samuel Keyser (3 Beds)
- Sara Pyle McAlpin and James Tolman Pyle,
in memory of their father, William Scott Pyle
- The Reformed Protestant Dutch Church in
Garden Street
- John Sloane, in memory of his brother,
Thomas Chalmers Sloane
- John Sloane, in memory of his father,
William Sloane
- 1908 William R. Craig, in memory of his sister,
Florence Faxon Craig
- George B. Goldschmidt, in memory of his mother,
Celestine Goldschmidt
- Samuel Anthony Goldschmidt, in memory of his
mother, Celestine Goldschmidt
- Mrs. Stephen V. Harkness, in memory of her
husband, Stephen V. Harkness
- Charles H. Marshall, Jr.
- 1909 Rev. and Mrs. Robert Russell Booth, in memory
of "Minnie and Willie"
- Canadian Society of New York
- Edward West Currier, in memory of his
stepmother, Laura Currier
- Edward West Currier, in memory of his
stepbrother, Walter B. Currier
- Edward West Currier, in memory of
Edward W. Currier
- Estate of Mary Jane Johnson, in memory of her
husband, William H. Johnson
- J. Theresa Keyser, in memory of her husband,
Samuel Keyser
- Julia Hannon Lyle
- Winfield Tucker, in memory of Joseph, Isabelle
and Adeline (3 Beds)
- J. Spencer Turner, in memory of his first wife,
Cornelia J. Turner
- 1910 Jane A. Townsend, in memory of her son,
Randolph W. Townsend, Jr.
- Jane A. Townsend, in memory of her son,
Harmon W. Norton
- Jane A. Townsend, in memory of her daughter,
Emma L. Norton
- Amelia Mott Graham, in memory of
Malcolm Graham
- Adeline Ives Latham, in memory of her husband,
John Howard Latham
- Estate of Josephine G. Lord, in memory of her
husband, Franklin B. Lord
- 1911 Brearley School Girls and others interested, in
memory of Madam Bertha Beck, the
"Madam Beck Memorial Teacher's Bed"
- Harriet Coles, in memory of her sisters,
Susan and Anna Codman
- Caroline Thorn Kissel, in memory of her husband,
Gustav Edward Kissel
- Katherine Spencer Leavitt, in memory of her
husband, Rev. William Leavitt (2 Beds)
- Reformed Low Dutch Church of Harlem
- Frederick Sturges, in memory of his father,
Jonathan Sturges
- William Stewart Tod, in memory of his brother,
George Tod
- 1912 Melville de Wolf, in the Children's Ward,
the "Emma de Wolf Bed"
- Gustavia A. Senff, in memory of her husband,
Charles A. Senff
- Mrs. Christopher M. Bell, "The Dennistoun Bed"
- 1913 Cornelia Eaton, to be known as "The Dr. Reuben
S. Carpenter Memorial" (3 Beds)
- Mrs. Jeremiah V. Meserole, in memory of her son,
Abraham Meserole
- Josephine Penfold
- Jane G. Phelps, in memory of her husband,
Anson G. Phelps, Jr. (2 Beds)
- 1914 Hugh D. Auchincloss, in memory of his mother,
Elizabeth Auchincloss
- Jane Elizabeth Grannis, in memory of her mother,
"Charlotte Williams Platt Bed"
- William H. Penfold, in memory of
Josephine Penfold
- Louise Tillinghast, in memory of her sister,
Amelia C. Babcock
- Estate of Minnie Hackett Trowbridge (5 Beds)
- 1915 A Friend, in memory of Sophia Kellogg Stebbins
and Mary Tompkins Kimball
- A Friend
- Mrs. Jeremiah V. Meserole, in memory of her
father-in-law, Abraham Meserole
- Mrs. Jeremiah V. Meserole, in memory of her
husband, Jeremiah Vanderbilt Meserole
- Mrs. Jeremiah V. Meserole, in memory of her
brother, Adolphus Clock
- Mrs. Jeremiah V. Meserole, in memory of her
parents, Alfred and Anna Maria Clock
- 1916 Emil C. Bondy, in memory of
Margaret Carson Cowan
- Central Presbyterian Church
- Mr. and Mrs. James Petrie Chalmers, in memory
of James Petrie Chalmers, Jr., "The Chalmers
Memorial Bed"
- Robert A. Chambers, in memory of his father,
Robert Chambers
- Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
- William D. Sloane (3 Beds)
- 1917 Emeline Y. Danforth, in memory of
Mrs. William B. Jenkins
- Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
- Estate of Sarah C. Miller
- Albert Winter, in memory of
Adaline Benson Winter
- 1918 Ida Leora Olmstead, to be known as the
"Leora McCammon Bed"
- 1919 Samuel Elliott
- Elizabeth Keys, in memory of her daughter,
Edith Keys
- Rutgers Presbyterian Church

- Estate of James R. Steers, in memory of his former wife, Rebecca E. Steers
 Estate of John W. Sterling
- 1920 William C. Boschen, to be known as the "Boschen Bed"
 Rosa Franklin (4 Beds)
 Francis P. Furnald
 Mrs. Francis P. Furnald
 Mary A. Harriot, to be known as the "Margaret Harriot Alms"
 Mary A. Harriot, to be known as the "James Harriot Alms"
 Mrs. Henry O. Havemeyer, in memory of her parents, George William and Matilda Adelaide Elder
 Estate of Margaret J. Orr, in memory of her mother, Ann Boyd Orr
 Anna St. John, in memory of her brother, Milton St. John
- 1921 Mrs. Peter B. Wyckoff, to be known as the "Sidney Dillon Bed"
 Henry M. Gescheidt
 Ralph E. Prime, in memory of his daughter, Ruth Havens Prime
 Joseph K. Gwynn
 Charles S. Ward, in memory of his friend, Sophie L. Kinman
 Charles S. Ward
- 1922 Minetta C. Howenstine (8 Beds)
 Christina C. Munro, in memory of her husband, John Munro
 Anna M. Romaine, in memory of Dr. William I. Detmold
 Estate of Arnold Thayer (2 Beds)
 Hamilton B. Tompkins, in memory of his wife and himself
- 1923 Lydia Augusta Brown
 Josephine Newman Hall
- 1924 Bohemian Society "Lidumil"
 Cordelia F. Turrell
 Nannie Gyles Johnson, (Children's Ward), in memory of her son, Shirley Everton Johnson
 Mrs. William John Fitzgerald
- 1925 Christina Bond, in memory of Julia C. Skidmore George Clarke
 Estate of Elizabeth J. Hofer, in memory of Catherine Parke and Horatio C. Kretschmar (2 Beds)
 Edward M. Morgan Memorial Association, in memory of Edward M. Morgan (4 Beds)
 Jennette Robertson, to be known as the "Helen C. Inslee Endowed Bed"
- 1926 Elizabeth Ellen Auchincloss, to be known as the "E. E. Auchincloss, Jr. Bed"
 Members of the New York Stock Exchange, to be known as the "Seymour LeGrande Cromwell Memorial" (2 Beds)
 Edmund Penfold, in memory of Josephine Penfold and William Hall Penfold (2 Beds)
 Dr. and Mrs. M. Allen Starr, in memory of Allen Egbert Starr
- John B. Trevor, in memory of Emily N. Trevor
 George D. Widener
- 1927 The Second Presbyterian Church in the City of New York
 Ellen Mills Borne, in the Children's Ward, to be known as the "John E. Borne Bed" and the "Nellie M. Borne Bed" (2 Beds)
 Virginia Marquand Monroe, in the name of the Young Men's Christian Association
 Mrs. Charles H. Senff, to be known as the "Dr. George A. Tuttle Bed"
 W. Frazer Gibson, in memory of his mother, Jeanette Frazer Gibson, to be known as the "Jeanette Frazer Gibson Bed"
 Augustus C. Gurnee, in memory of his mother, Mary M. Gurnee (2 Beds)
 Eliza V. Nicholson
 Mrs. Murray W. Dodge and Mrs. Franklin Lord, in memory of their mother, Mrs. Fordyce D. Barker (Single Ward Room)
 Dunlevy Milbank (Single Ward Room)
 F. Ethel Wickham, in memory of her father, William Hull Wickham, to be known as the "William Hull Wickham Bed" (Single Ward Room)
 Anna A. Johnston, in memory of her parents, William G. and Adriana C. Gardner
 Anna A. Johnston, in memory of Lewis, Anna, Edward and Mary Johnston (Single Ward Room)
 Broadway Presbyterian Church, to be known as the "Walter Duncan Buchanan Bed"
- 1928 North Presbyterian Church
 In memory of McKevers Bayard Brown (Single Ward Room)
 Caroline B. Sellew (4 Beds)
 The Red Cross Rooms for Nurses (3 Single Ward Rooms)
 Robert W. deForest (Single Ward Room)
 Henry W. deForest (Single Ward Room)
 James R. Steers
 Jane Livingston Armour, in memory of John A. Livingston
 Jane Livingston Armour, in memory of Herman O. Armour
 In memory of Meredith Howland Pyne
 Stella C. and Roi C. Megrue (Single Ward Room)
 Mrs. E. C. Wills, in memory of her mother, Mrs. J. F. Ackerman, and her sister, Mrs. W. Clarence Reed
- 1929 Caroline White, in memory of her sister, Eliza W. White
 Elizabeth A. Hays, in memory of William and Charlotta Hays
- 1930 Mr. and Mrs. Ernest Trow Carter
 The Presbyterian Church in the Town of Rye, New York
 Mrs. Arthur E. Lauderback, in memory of her mother and father, Esther Hull Jackson and Peter A. H. Jackson
 Mary L. Walker Peters, to be known as "The Charles Grenville Peters and Mary Walker Peters Free Bed"

- Marie F. Coddington, to be known as
"The Emilie Coddington Bed"
- 1931 Mrs. Clara Beales Obrig, in memory of
Adolph Obrig and Clara Beales Obrig
(Single Ward Room)
- Alfred V. Meserole, in memory of his mother,
Evelina A. Meserole
- 1932 In loving memory of Justine Adele Stafford
(Mrs. W. F. Stafford) by her sister,
Ida Evelina Bliss
- 1933 Mrs. John A. Hance and Mrs. Irene Louise Hance,
in memory of James R. Jesup
- 1934 Ida Adams, in memory of her sister, Sadie E. and
her brother, Robert F. Adams (Single Ward
Room)
- Josephine Leyoldt, in memory of her brothers,
Louis and Frederick Leyoldt (2 Beds)
- 1935 Walter J. M. Donovan, in memory of his father,
Timothy Donovan
- 1936 Elizabeth P. Hewes, to be known as
"The Elizabeth P. Hewes Bed"
- Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
- Mary S. Thayer, to be known as
"The Orlando Thayer Bed"
- 1937 Margaretta J. Gamble, to be known as
"The Gamble Bed," in memory of her
father and mother
- Jeremiah Milbank, in memory of his father,
Joseph Milbank
- 1938 Susetta L. Goss, to be known as "The Goss Bed,"
in memory of her parents, Rev. C. C. Goss and
Theodosia C. Goss
- Annie Miller, to be known as "The Mrs. Alexander
Miller Memorial Bed," in memory of her
mother, Mrs. Alexander Miller
- Bertha H. Minturn, in memory of her most
faithful and beloved nurse, Mary Humphries
- Henry T. Sloane, to be known as "The Euphemia
Sloane Coffin Bed," in memory of his sister,
Euphemia Sloane Coffin
- 1939 "In Memoriam"
- Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
- 1940 George Gibbs, to be known as "The George
Gibbs Bed"
- 1942 Mrs. Huntington McLane, to be known as the
"Therese K. Thorne Bed," in memory of her
mother
- Cornelia Livingston Pell, in memory of
Alfred Duane Pell
- Frank Wallach, in memory of Ida May Wallach
- 1943 Stuart Duncan, to be known as
"The Stuart Duncan Bed"
- 1944 Anonymous, to be known as "The Dr. William
Darrach Bed"
- John Fraser, in memory of his parents,
Alexander and Elizabeth Fraser
- 1945 Robert W. Carle, in memory of his mother,
to be known as the "Cornelia Willets Carle Bed"
for general hospital use including harelip and
cleft palate cases
- 1947 W. and J. Sloane
- Frederick Sturges, Jr., Mrs. Mary Armit Sturges,
Mrs. Catharine Armit Chapman and Frederick
Sturges, III, in memory of Frederick Sturges
- Walter S. Gifford, in memory of his son,
Walter Sherman Gifford, Jr.
- Ida L. Darling, to be known as the
"Richards Memorial Bed"
- John Sloane, in memory of his wife, Elsie Nicoll
Sloane, to be known as the "Elsie Nicoll
Sloane Bed"
- Elisa Smith Mabon, in memory of her husband,
James Brown Mabon
- 1948 Otto M. Eidlitz, to be known as the "Eidlitz Bed"
- 1949 Effie B. Sheaman
- 1951 Gerrish Hill Milliken
- 1952 William Dzus, to be known as the "Ukrainian
Institute of America, Inc. Bed"
- 1953 Estate of Charlotte C. Garretson, to be known as
the "Charlotte Higbee Kelsey Bed"
- W. Alton Jones Foundation, Inc., to be known as
the "Nettie Marie Jones Bed"
- 1954 Estate of M. Samuel Stern, to be known as the
"M. Samuel Stern Memorial"
- 1955 Estate of Robert J. Eidlitz, to be known as the
"Marc Eidlitz Bed"
- Mrs. John S. Holbrook, in memory of her parents,
John Johnston and Mary Sloane Sinclair
- 1956 Estate of Aurie Dell Black, to be known as the
"Aurie Dell Black Bed"
- Robert W. Carle, to be known as the
"Adele Skiddy Carle Bed"
- Estate of Adolph Riesenbergs, to be known as
"The Adolph and Anna A. Riesenbergs Bed"
- 1957 George F. Cahill, M.D., to be known as the
"Endowed Bed for Personnel of the Squier
Urological Clinic"
- Edward H. Carle, in memory of his father, to be
known as the "John J. Carle Bed"
- Mrs. William J. Demorest, in memory of her
parents, Wealthy H. Lewis and
Richard James Lewis
- Chancellor Kent Lodge 870, Free and Accepted
Masons, in memory of George J. Weissman
- Morris Morgenstern Foundation, to be known as
the "Sadie B. Morgenstern Bed"
- Estate of Mary Ross Potter, to be known as the
"Georgianna Morley Bed"
- Estate of Mathilde S. Sterne, to be known as the
"Simon Sterne Beds" (4 Beds)
- Board of Trustees of The Presbyterian Hospital,
in honor of and to be known as the "Charles P.
Cooper Endowed Bed"
- 1958 Mrs. Robert W. Carle, to be known as the
"Robert W. Carle Bed"
- 1959 William Dzus, to be known as the "Ukrainian
Institute of America, Inc. Bed"
- Mrs. Stanley G. Mortimer, to be known as the
"Stanley G. Mortimer Bed," in memory of her
husband
- Mrs. John S. Thacher, to be known as the "Frances
E. Baker Bed," in memory of her mother

- 1960 Estate of Exerene L. Flood, to be known as the "Dr. George Ballery Flood Endowed Bed"
 Minister, Elders and Deacons of The Collegiate Reformed Protestant Dutch Church of The City of New York, to be known as "The May A. Ingenthron Memorial Bed"
- Estate of James Miller, to be known as the "A. Miller Endowed Bed"
- Estate of Joan D. Sanger, to be known as the "Bertram J. Sanger Endowed Beds" (2 Beds)
- 1961 Estate of Ellen Clarke Bertrand, to be known as the "Ellen Clarke Bertrand Memorial Endowed Bed"
 Mr. and Mrs. Samuel W. Meek, in memory of Michael Jeremy Meek
- 1962 Mrs. William J. Demorest, to be known as the "Howard W. Albro Memorial Endowed Bed"
 Estate of Henrietta S. Wolf, to be known as the "Julia Wolf Endowed Bed"
- 1963 George S. Walden, in loving memory of Mrs. Julia E. Carroll
- 1965 Estate of Mildred E. Sterry, in memory of her mother, Katherine Landers; her brother John J. Landers and herself (4 Beds)
- 1966 Estate of Agnes Irvine, in the name and memory of Daniel Elmer Salmon (6 Beds)
 Estate of Florence R. Paul, in memory of her mother, Kathryn Wilson Roberge (5 Beds)
 Estate of Florence R. Paul, in memory of her brother, Franklin Pierce Roberge
- 1967 Estate of Clarence J. Schmelzel, to be known as the James Henry Schmelzel and Annie Louise Schmelzel Endowed Beds. (12 Beds)
- 1968 Estate of Catherine Ridley, in memory of her mother, Catherine Ridley, and her father, Arthur J. Ridley (5 Beds)
- 1969 Estate of Catherine Ridley, in memory of her mother, Catherine Ridley, and her father, Arthur J. Ridley (7 Beds)

Memorial Endowed Beds for Research Purposes

- 1948 Mrs. William Barclay Parsons, in memory of her husband, General William Barclay Parsons
 Muriel Jane Rudinger Foundation, Inc., to be known as the "Muriel Jane Rudinger Bed"
- 1950 Charles E. Culpeper Foundation, Inc. (2 Beds)
- 1952 John F. Bush Memorial Bed
 Estate of Selma Boyd, each to be known as a "Boyd Bed" (2 Beds)
 Bruce Barton, in memory of his wife, to be known as the "Esther Randall Barton Memorial Bed"
- 1953 Herman Goldman Foundation, Inc., in memory of Theresa and Frank Goldman
 W. Alton Jones Foundation, Inc., in memory of Mamie W. Marvin
- 1954 Mr. and Mrs. Charles P. Cooper, in memory of Mrs. Cooper's father, Dr. Charles Lathrop Parsons

- "John Shepard Parke Memorial Bed"
 Mr. and Mrs. Sidney J. Weinberg, in memory of their parents
- 1955 Bruce Barton, in memory of Clyde Scott and Helen Barton Stilwell, to be known as the "Clyde Scott and Helen Barton Stilwell Memorial Bed"
 George F. Cahill, M.D., Research Bed in the Department of Urology
 Mr. and Mrs. Charles P. Cooper, in memory of Mrs. Cooper's mother, Mrs. Charles Lathrop Parsons
 Herman Goldman Foundation, Inc., in memory of Theresa and Frank Goldman
 Williams-Adler Foundation Bed
- 1959 "John Shepard Parke Memorial Bed"

Endowed Rooms

- 1903 Henry H. Rogers, to be known as "Room J"
- 1905 Mrs. Morris K. Jesup, to be known as the "Eliza de Witt Memorial Room"
- 1910 Mrs. John Stewart Kennedy, in memory of her husband, to be known as the "J. S. K. Memorial Room"
- 1912 Peter Cumming, to be known as "The Peter Cumming Memorial Room"
- 1926 Alumnae Association of the School of Nursing of The Presbyterian Hospital, to be known as the "Amabel S. Roberts Memorial Room"
- 1928 Mrs. William Sloane, to be known as "The William Sloane Room for Graduate Nurses"
- 1930 The Sarah A. Hard Taylor Memorial Fund, to be known as "The Sarah A. Hard Taylor Room"
- 1935 Mrs. Herbert Neal, in memory of her first husband, James Norman Hill
- 1937 S. Augusta Mora, in memory of her husband, Frank Mora and mother, Sarah Robson Van de Water
- 1946 Estate of Caroline Catherine Cary, to be known as the "Caroline Catherine Cary Endowed Room"
- 1960 Mr. and Mrs. Robert W. Carle, to be known as "The Robert W. and Adele S. Carle Endowed Room"
 Estate of Bertha C. Miller, to be known as the "James Miller Endowed Room"
- 1961 Estate of Sarah Louise Johnston, to be known as the "Andrew Johnston Memorial Room"
- 1962 The Dr. Thomas W. Stevenson Memorial Fund, a semi-private room to be known as "The Dr. Thomas W. Stevenson Memorial Endowed Room"
- 1963 Estate of Adele S. Carle, to be known as the "Robert W. Carle Rooms" (7 Rooms)
- 1964 Mr. John S. Thacher, in memory of his mother, Frances Lake Thacher
- 1965 Estate of Jennie Hankinson Sinclair, two rooms to be known as "The Francis MacDonald Sinclair Endowed Room," and "The Jennie Hankinson Sinclair Endowed Room"

Babies Hospital

- 1892 The Cribside Committee, to be known as "Cradyl-Nyst"
- 1894 Miss Ellen James Evans
Henry Stewart Trevor, by Mrs. Henry G. Trevor
- 1895 Mrs. Evan T. Walker
Mrs. Richard Arnold, in memory of Georgiana Arnold
- 1896 Mr. and Mrs. Charles M. Fry, to be known as the "Mr. and Mrs. Charles M. Fry Bed"
- 1897 Mrs. George Kemp, for the use and purposes of the Hospital
- 1898 Mrs. Oliver G. Jennings, to be known as the "Brewster Bed"
- 1899 Mr. and Mrs. John Sherman Hoyt, in memory of John Sherman Hoyt, Jr.
- 1900 Mrs. Elizabeth Chamberlin Lockwood, in memory of Emily Beaver Chamberlin
- 1902 Mr. and Mrs. William E. Dodge, in memory of their granddaughter, Grace Osborn
Henry P. Wertheim, in memory of Clara W. Wertheim
- 1904 Mr. and Mrs. George Arents, in memory of George Arents Brown
Estate of Mrs. Charles Harvey Hartman
- 1905 Mrs. J. Henry Lane
Mrs. Daniel S. Lamont, to be known as the "Julia Lamont Bed"
- 1907 The Cribside Committee
- 1908 Arthur W. Butler, in memory of Elizabeth Marshall Butler
- 1910 Dr. and Mrs. L. Emmett Holt, in memory of Kenneth M. Holt
Edwin Clarence Moller, in memory of his father, Peter Moller
- 1911 Emily A. Watson, in memory of Wheeler Watson
Mrs. Bradley Martin, in memory of David Bradley Martin
- 1912 In loving memory of J. Bradley Cumings, endowed by his friends. "Greater love hath no man than this, that a man lay down his life for his friends."
— St. John 15:13
- 1914 Mrs. Andrew Carnegie, in memory of Archibald Fraser Barrow
Estate of Mrs. Robert W. Todd, to be known as "The Mabel Todd Bed"
- 1916 Mr. and Mrs. John Chandler Moore, in memory of Edward de Bébian Moore, the "Edward de Bébian Moore Bed"
Mrs. John Hubbard, in memory of Margaret Fahnestock
Mrs. Clarence M. Hyde, to be known as the "Clara Mathewson Hyde Bed"
- 1917 Harris Brisbane Dick, to be known as the "Harris Brisbane Dick Free Bed"
Mrs. Edward S. Harkness, to be known as the "Thomas Stillman Taylor Bed"
Mr. and Mrs. Walter A. Hirsch, in memory of John Walter Hirsch
- 1919 Mr. and Mrs. Daniel Schnakenberg, in memory of their daughter, Anna Kate Bartlett
Mrs. John Jay Knox, in memory of John Jay Knox
Mrs. John Jay Knox, in memory of Dr. Reuel B. Kimball
- 1920 Mrs. Andrew Carnegie, a thanks offering for Louise Carnegie Miller
- 1921 Estate of Jacob H. Schiff
- 1922 The Cribside Committee, in memory of Sarah Elizabeth Williams
Mr. and Mrs. Simon Guggenheim, in memory of their son, John S. Guggenheim
- 1923 Mr. and Mrs. Herman Armour Nichols, in loving memory of Marie Louise Nichols
- 1929 Estate of Julia M. Stout
- 1930 Estate of Edith Crosby Thomson, in memory of her mother, Mrs. Grace H. Thompson
- 1934 West End Collegiate Church
- 1935 Estate of Daniel Schnakenberg, in memory of his children, Daniel Schnakenberg, Jr. and Marie Schnakenberg
- 1936 Estate of Carrie Guggenheim
- 1938 Estate of Emily S. Hornblower, in memory of her stepdaughter, Susie Sanford Hornblower, the "Susie Sanford Hornblower Bed"
- 1949 Dr. Frederic H. Bartlett. Endowed in loving memory of Frederic H. Bartlett, M.D., 1872-1948, by his patients and other friends, to commemorate his many years of faithful service in Babies Hospital
- 1950 Estate of Emelyn L. Coolidge, in memory of Marianna Wheeler and Emelyn L. Coolidge, M.D., to be known as "The Wheeler-Coolidge Bed"
Estate of Isabel Shields Kemp, to be known as the "Mary M. Shields and the Dr. Robert Coleman Kemp Free Bed"
- 1957 Estate of Martha S. Reynolds, in memory of her mother, Ernestine Schaffner
- 1962 Estate of Caroline D. Hewitt, to be known as the "Caroline Danella Hewitt Endowed Bed"
- 1964 Mr. and Mrs. Samuel Rogovin, in honor of their parents, Mr. and Mrs. Louis Rogovin and Mr. and Mrs. Bernard R. Simon

Neurological Institute

- 1929 The Red Cross Endowed Room for Nurses
Rivington-Dwyer Endowed Room for Nurses
- 1943 Alice Dunning Starr, in memory of her husband, Allen Starr
- 1959 Jack J. Dreyfus, Jr., in honor of his father, the "Jack J. Dreyfus, Sr. Bed"
- 1967 "In Memory of Mrs. Sidney J. Weinberg, donated by her husband and Family."
"In Memory of Helen Livingston Weinberg (Mrs. Sidney J. Weinberg) from funds donated by her friends and those of the Family."

**Memorial Endowed Beds
for Research Purposes**

1952 Estate of John H. Bahrenburg, in memory of
John H. Bahrenburg and Elizabeth Bahrenburg
(16 Beds)

New York Orthopaedic Hospital

1883 Miss C. B. Hicks, continued in perpetuity by
Buchanan Winthrop

1886 Mrs. Elizabeth Milbank Anderson, in memory of
J. Milbank Anderson (4 Beds)

1891 Alfred Corning Clark (3 Beds)
Edward Severin Clark, to be known as the
“Edward Severin Clark Beds” (2 Beds)
Mrs. Henry S. Winthrop

1893 Mrs. William D. Sloane, in memory of
William Douglas Sloane, Jr.
James K. Gracie, in memory of
Anna Bulloch Gracie
Miss Sarah B. Gibbs

1894 Mrs. Richard Tylden Auchmuty, in memory of
Richard Tylden Auchmuty (2 Beds)
James H. Jones

1896 Mrs. William Astor, in memory of
Helen Roosevelt
Mrs. Evan T. Walker, in memory of
John J. Walker

1897 Mrs. William D. Sloane, one bed in memory of
Maria Louise Vanderbilt and one in memory of
Emilie Vanderbilt Burden

1898 Mrs. Charles B. Alexander, for her daughter,
named the “Harriet Alexander Bed”

1901 Mrs. N. A. Baldwin, in memory of
Louise Suydam Duer
Mrs. Benjamin Brewster, in memory of
Benjamin Brewster
Jessie and Emily Sloane Bed, endowed by their
father, Henry T. Sloane
Mrs. Marion Story, in memory of
M. Furman Hunt

1902 James Henry Smith, in memory of
George Smith (2 Beds)
Miss Emily A. Watson, in memory of
Mrs. Mary J. Walker

1904 Miss Cornelia Prime, in memory of her brother,
Temple L. Prime
Miss Helen Phipps
James K. Gracie, in memory of
Esther Gracie Ogden

1906 Miss Caroline White
Mrs. M. Dwight Collier, in memory of
Maurice Dwight Collier

1908 Mrs. H. N. Munn, Mrs. Augusta Munn Tilney and
Orson D. Munn, in memory of
Henry Norcross Munn

1911 Estate of Everett C. Whitney
Miss Josephine C. Smith, in memory of her father,
Dr. Edward A. Smith, and her mother,
Rebecca Miller Smith

1913 Estate of Marion de Forest Clark, in memory of
Julian Bouton Clark
An anonymous donor, to be known as the
“Mary Townsend Cuyler Bed”
Caroline F. Butterfield, in memory of
Frederick Falconer Butterfield

1915 Miss Emily Trevor
Mrs. Frederick W. Vanderbilt, to be known as
“The Louise Bed”
George Grant Mason, in memory of his uncle,
James Henry Smith (2 Beds)

1916 Henry M. Tilford, in memory of
Catharine Hunt Tilford
Estate of Clementine Furniss, to be known
as the “Clementine Furniss Bed”
An anonymous donor

1917 Mrs. Charles H. Senff, in memory of her little son,
Henry Senff
Mrs. A. Murray Young, in memory of her
great uncle, Wilson G. Hunt

1919 R. Fulton Cutting, to be known as the
“Helen Suydam Cutting Bed”
Mrs. Frederick Delano Hitch
Levi P. Morton, in memory of
Anna Livingston Morton
Miss Georgiana G. R. Wendel, in memory of her
sister, Augusta A. S. Wendel (2 Beds)
Various donors, in memory of
Theodore Roosevelt

1920 Mrs. John Hobart Warren

1921 Mrs. Winthrop W. Aldrich, in memory of her
little son, Winthrop Williams Aldrich, Jr.
F. Ambrose Clark, to be known as
“The Florence L. Clark Bed”

1922 Mrs. David T. Dana, in memory of her mother,
Mrs. M. Dwight Collier

1924 Estate of Charlotte Bruce Bickmore, in memory
of Albert Smith Bickmore, Jr.
Estate of Louise Ward McAllister Lewis,
in memory of her mother, Sarah T. McAllister,
to be known as “The Sarah T. McAllister Bed”

1925 Estate of Elizabeth J. Hofer, in memory of
Horatio C. Kretschmar (2 Beds)
Percy Chubb, in memory of his wife
Junior Red Cross of the Public Schools of
the City of New York
Mrs. Douglas Robinson, in memory of her friend,
Charles Allen Munn

1926 Junior Red Cross of the Public Schools of
the City of New York

1927 Darrach Home for Crippled Children, in memory
of Dr. May Darrach

1928 Mrs. Mary L. Schoonmaker, in memory of
Sylvanus Lothrop Schoonmaker and
Frank Layng Schoonmaker (10 Beds)
Estate of Henry D. Dickinson, in memory of
Hathaway M. Dickinson

1930 James T. and Sarah Bancroft Leavitt, to be known
as the “Mrs. James T. Leavitt Bed”

- 1934 Henry C. deRham, Frederic F. deRham and Clarisse deRham Rutherford, in memory of their parents, Charles and Emily Howe deRham
- 1935 Mrs. Percy R. Pyne and family, in memory of Meredith Howland Pyne
- 1936 Miss Elizabeth Stewart Hamilton, in memory of Mrs. John Hobart Warren, to be known as the "Harriette Mott Warren Bed"
- Mrs. Edward S. Harkness, to be known as the "Dorcas House Bed" in dear memory of Wilma Gideon
- 1938 Miss Grace Howard Potter, to be known as the "Howard and Mary Louisa Potter Bed," in memory of her father and mother
- 1955 General and Mrs. E. F. Maude, in memory of Mrs. Maude's father, Robert S. Brewster
Estate of Carrie Rosenshine, to be known as "The Lillie Rosenshine-Marjorie L. Kaufman Bed"
- 1956 Estate of Adolph Riesenbergs, to be known as "The Adolph and Anna A. Riesenbergs Bed"
- 1967 Estate of Elliot W. Lawrance, in memory of Clifford Lawrence King.
- 1967 Estate of Elliot W. Lawrance, in memory of Mrs. Thelma Mary Lawrance.

Endowed Rooms

- 1922 Glenn Ford McKinney, a ward room in the country branch, in memory of his wife, Jean Webster McKinney
- 1929 400 of his friends and associates, a room in the private pavilion, in memory of H. Le Roy von Lackum, M.D., surgeon in this hospital, 1916-1928

- 1967 Mrs. Anna I. Feldman, a semi-private room, in memory of her husband, to be known as the Anna I. Feldman Room, in loving memory of her husband, Irving J. Feldman.

Institute of Ophthalmology

- (Including Herman Knapp Memorial Eye Hospital)
- 1883 Mrs. Oswald Ottendorfer
- 1884 Miss Henrietta A. Lenox
- 1895 Miss Mary Morris van den Heuval
- 1897 Mrs. Giovanni Ceccarini
- 1913 Miss Catherine A. Bliss
Miss D. Willis James
- 1918 Truman Peck Stone
- 1921 Miss Rosie Bernheimer, in memory of her parents
- 1923 Miss Mary Wiley, in memory of her brother, George Wiley
- 1928 Mrs. Matilda Townsend Palmer
- 1931 Lee Doblin
- 1936 Charles M. Brooks
- 1957 The Mortimer and Harriet M. Marcus Foundation, Inc., to be known as "The Mortimer and Harriet M. Marcus Endowed Bed"
- 1964 Estate of Thomas W. Byrnes, in memory of his wife, Minnie Marcey Jarboe Byrnes

Endowed Bed for Research Purposes

- 1965 Malcolm P. Aldrich, to be known as the "Malcolm P. Aldrich Endowed Research Bed"

Index to Professional and Academic Staffs

PAGE	PAGE	PAGE			
Abdullah, Syed	284	Ansanelli, Jr., Vincent P.....	286	Balser, Benjamin H.....	259, 284
Abel, Marshall	256	Antennucci, Arthur J.....	274	Bank, Arthur	253, 272
Abell, Liese L.....	271, 273	Applebaum, Edmund	270	Banyard, Richard	257
Abrahams, Irving	253, 272	Appleby, Robert E.....	259, 279	Barach, Alvan L.....	252
Abrams, Cyril A. L.....	258, 280	Applewhite, Harold L.....	291	Baran, Gerry M.....	252
Abramson, Harry	259	April, Ernest W.....	270	Baratz, Robert A.....	252, 271
Ackerman, Nathan W.....	259, 282	Aranow, Jr., Henry	241, 253, 272	Barbee, William R.....	253
Ackley, Jr., Alexander	254	Arden, Howard A.....	266, 291	Bard, Richard H.....	262
Adams, George H.....	282	Arm, Stuart B.....	256	Barden, Herbert	278
Adams, Mary	258	Arnsdorf, Morton	254	Barker, Doris	275
Adams, Robert M.....	262	Aronoff, Michael S.....	260	Barker, Harold G.....	261, 285
Adamsons, Jr., Karlis.....	256, 276	Asch, Thane	261, 285	Barker, Leslie P.....	252, 272
Adcock, III, Eugene W.....	259	Ashford, Thomas P.....	286	Barkhuus, Arne C. V.....	280
Adelson, Jerry J.....	291	Ashley, Charles A.....	264, 279	Barnaby, Jr., Henry	292
Adler, Theodore	291	Asnes, Russell S.....	259	Barnes, Douglas H.....	276
Adlersberg-Zolman, Mella	271	Ast, David B.....	282	Barnum, Howard J.....	254, 273
Adsit, Charles G.....	274	Atchley, Dana W.....	240, 252, 270	Barone, Mary R.....	275
Agate, Frederic J.....	270	Athos, William J.....	274	Barrer, Harry G.....	291
Akasaki, Keijiro	257	Atkin, M. David	259, 279	Barrett, C. Redington	274
Akiyama, Toyooairo	275	Attia, Albert	274	Barrett, James E.....	283
Albert, Harry D.....	260	Atwood, Kimball C.....	264, 272	Barrett, Robert E.....	255, 275
Albert, Morris S.....	258	Atwood, William G.....	253, 272	Barry, J. Wright	254, 273
Albrecht, Robert M.....	280	Auburn, Robert	256	Bartelstone, Herbert J.....	
Aldin, Peter	284	Auchincloss, Jr., Hugh	261, 286	266, 267, 280, 290	
Alexander, George	271, 283	Auerbach, Irwin J.....	284	Bartsich, Ernst G.....	256
Alexander, Jack T.....	280	Auerbach, Richard C.....	261	Bartwink, Jerome	292
Alexander, Stewart F.....	254, 273	August, Burton	260, 283	Baruch, Jack	260
Alfaro, Maurice J.....	257	Avella, Arthur N.....	260	Basek, Milos	257, 264, 277
Algus, Seymour	291	Avery, Charles W.....	260	Bassett, Arthur L.....	280
Allard, Gilles G.....	278	Ayers, Herbert D.....	266, 291	Bassett, C. Andrew L.....	257, 264, 277
Allderdice, Penelope W.....	276	Azar, Henry A.....	258, 278	Bassett, Earle R.....	291
Allen, Lucretia	278	Azar, Isaac	253	Battista, Joseph	256
Allen, Jr., Thomas E.....	260	Azzoni, Alfred A.....	262	Bauer, Herman E.....	282
Allessandri, Raul	258	Bach, Diana	280	Bauman, Eli	254, 273
Almenoff, Irving A.....	278	Bachman, Arnold L.....	285	Bauman, Gerald	282
Alpert, Elmer	274	Bachman, Donald M.....	262	Bauman, William A.....	258, 279
Alpert, Meyer	285	Bachman, Lillian H.....	291	Baumgarten, Jr., Harold	280
Alston, Casco	253, 273	Bachner, Paul	278	Baumstark, Reynold J.....	290
Altman, Harry S.....	258	Back, Karen J.....	259	Baurmash, Harold D.....	290
Altmann, Kenneth A.....	274	Badder, Elliot M.....	262	Bautz, Ekkehard K. F.....	278
Altshuler, Kenneth Z.....	283	Baden, Ernest	278	Beach, Jr., Paul M.....	262, 286
Altuzarra, Luis F.....	252	Badgley, Robin F.....	282	Beaty, John T.....	254, 273
Amarasingham, Chandra Raj	273, 279	Baehr, George	282	Bebhard, Roger L.....	255
Amberson, J. Burns.....	252	Baer, Leslie P.....	254, 273	Beck, Gustav J.....	254, 273
Ambrose, George B.....	257, 270, 277	Baerg, Richard D.....	254, 273	Beck, Leah	260, 283
Ames, Richard P.....	254, 274	Bailey, Margaret B.....	282	Becker, Alfred	254
Ames, Rose G.....	258, 279	Bakamjian, Veronica	271	Becker, Jr., George L.....	274
Amols, William	275	Baker, Alice T.....	254	Becker, Joshua A.....	261, 285
Amos, Franklyn B.....	282	Baker, Jr., Daniel C.....	240, 257, 264, 265, 277	Beckmann, Albert J.....	258, 281
Amundson, David	288	Baker, David H.....	261, 285	Bedford, John M.....	270, 288
Anderson, Albert D.....	261, 285	Baker, Katherine J.....	273	Bednarz, Brian E.....	262
Anderson, C. Thomas	258	Baker, Vernon B.....	274	Been, Harold	260, 284
Anderson, Ethel I.....	277	Baldwin, Jr., John M.....	253, 272	Begg, Charles F.....	279
Anderson, Helen M.....	253, 273	Balfe, John W.....	259, 279	Behrens, Myles M.....	257
Anderson, Julien W.....	266, 290	Balkoura, Athanasia	260	Beiser, Sam M.....	264, 274
Andiman, Warren A.....	259	Ball, Richard	257	Belair, Carmela V.....	276
Andreae, Eric	274	Ballantyne, Lowyd W. R.....	286	Belanger, Raphael	255, 273, 287
Andree, Ronald	271	Ballard, Andre B.....	260, 283	Beldoch, Michael	283, 288
Andrews, David L.....	257, 264, 277	Ballard, Harold S.....	274	Belinson, Jerome	256
Andrews, George C.....	252			Bell, A. Loomis	274
				Bell, Donald C.....	260, 284

PAGE	PAGE	PAGE			
Bell, Jenifer J.....	258, 279	Blakemore, Arthur H.....	252	Breuer, Jack M.....	291
Bell, William B.....	285	Blanc, William A.....	258, 278	Brewer, Alfred E.....	254, 273
Beller, Alexander	283	Blancato, Louis S.....	271	Brickner, Philip W.....	254, 274
Bellin, Howard T.....	262, 286	Blank, Martin	280	Bridges, Thomas J.....	255, 274
Beltrani, Vincent S.....	253	Blasberg, Ronald G.....	256	Briere, Alix L.....	279
Benamy, Daniel A.....	275	Blechman, Abraham M.....	291	Briggs, John Philip.....	260, 283
Bender, Estelle P.....	260	Blechman, Martin G.....	281	Brill, Henry	284
Bender, Michael D.....	254	Bleiweiss, Herman	283	Brisbane, Samuel C.....	271
Benesch, Reinhold	271	Bless, Stuart D.....	255	Briscoe, Anne M.....	272, 274
Benesch, Ruth E.....	271	Blitz, Alma T.....	258, 280	Brisman, Ronald	255
Benfield, James W.....	290	Block, Philip	292	Britten, John S.....	254, 280
Benitez, Helena H.....	286	Block, Stanley	259	Britten, Mary X.....	275
Benkel, Bernard	292	Bloom, Stanley	262	Brod, Morton S.....	291
Bennett, Courtenay L.....	282, 284	Bloomfield, Martin E.....	273	Brodey, Marvin	253, 272
Bennett, Ruth	283	Blum, Jr., Alexander.....	258, 279	Brody, Michael	260
Bennett, Stephen Lamar	260, 283	Blum, Bertram	290	Bronson, Winifred	254
Bennett-Clark, Suzanne	281	Blum, Howard I.....	290	Brooks, Mary J.....	276
Benninghoff, Daniel W.....	278	Blume, Ralph S.....	255	Broom, W. Bryan J.....	252
Benoit, Edith B.....	276	Blumenfield, Thomas A.....	258	Brosnan, Frances C. F.....	274, 286
Benson, William E.....	255	Blumenstock, David A.....	286	Brown, Dennis G.....	256
Berdon, Walter E.....	261, 285	Blumenthal, Marvin R.....	280	Brown, Donald E.....	278
Berg, Marc L.....	291	Blumenthal, Richard L.....	283	Brown, Geraldine S.....	275
Berger, Agnes P.....	280	Blumenthal, Sidney	258, 264, 279	Brown, Gregory N.....	279
Berger, Milton M.....	283	Bobrow, Elias N.....	275	Brown, Harold W.....	240, 260, 280
Bergner, Lawrence	281	Boelster, Roy	290	Brown, Howard D. H.....	257
Berk, Paul D.....	255	Bombardieri, Stephano	255	Brown, Howard J.....	282
Berke, David R.....	255	Bondinell, William E.....	271	Brown, James A.....	254
Berl, Soll	275	Bonilla, Luis	261	Brown, Paul A.....	258
Berlin, Frederick	291	Bonomo, Gregory	256	Brown, Roy H.....	285
Berman, Charles L.....	291	Boone, Patricia	276	Brown, Virginia M.....	281
Bernal, Eva B.....	274	Booth, Carl B.....	255, 275	Brown, Jr., Walter U.....	253
Bernard, Viola W.....	282, 259	Bora, Sunder S.....	273	Brownlee, William H.....	284
Bernards, Walter C.....	271	Bordiuk, Joseph M.....	258, 279	Brownstein, Shale	284
Bernhard, William	278	Boris, Jacob	259, 280	Bruce, Gordon M.....	252, 270, 277
Bernot, Robert	274	Borsky, Paul N.....	281	Bruenn, Howard G.....	253, 272
Berry, Frank B.....	270	Boschenstein, Frank K.....	255, 275	Bruggeman, Lewis L.....	261
Bertles, John F.....	254, 274	Bossart, Peter A.....	287	Brunner, Hans	255
Bertrand, Charles A.....	274	Bourne, Henry R.....	254	Brunngraber, Elinor F.....	271
Bertsch, Robert G.....	261, 262, 286	Bowe, Edward T.....	256, 262, 276	Brunnstrom, Signe	286
Besen, Gerald H.....	290	Bowen, Florry P.....	275	Bruno, Sebastian A.....	253, 291
Beskyd, Peter P.....	284	Bowens, Jr., Mark A.....	255	Brunswick, Ann F.....	281
Bethke, Emil G.....	277	Bowman, Frederick O.....	261, 286	Brush, John M.....	258
Bettini, Guelielmina	252	Bradford, David S.....	257	Brust, Jr., John C. M.....	256, 275
Beube, Frank E.....	266, 291	Bradford, Mary E.....	259, 279	Brust, Matilda B.....	259, 279
Bezuyen, Mary N.....	276	Bradley, Geraldine P.....	254, 273	Brust, Raymond	261
Bhonslay, Shivaji B.....	261, 264, 286	Bradley, Stanley E.....	240, 241, 253, 264, 265, 272	Bruun, Bertel	256
Biavati, Bruce J.....	285	Bradlow, Paul A.....	283	Brzustowicz, Stanislaw H.....	290
Bickerman, Hylian A.....	254, 272	Brady, Ursula M.....	275	Buchanan, John L.....	253, 272
Biehl, Robert F.....	259, 279	Bragg, Everett C.....	257, 277	Buckholz, Patricia K.....	276
Bierman, Robert H.....	258, 279	Bragg, III, Franklin E.....	254	Buda, Joseph A.....	261, 286
Bigger, Jr., John T.....	253, 272	Braham, Stanley B.....	262, 287	Budd, Daniel C.....	262
Bilchick, Edwin B.....	257	Braida, Alfred J.....	291	Budin, Joel A.....	262
Bilezikian, John P.....	255	Branche, George C.....	274	Budinger, John M.....	278
Bingham, William F.....	255, 256	Branche, Matthew D.....	286	Budowsky, Jack	253, 292
Binkert, A. J.	240, 241, 265, 282	Brand, Leonard	252, 262, 271	Bull, Marcia B.....	254, 273
Bird, Hector R.....	260	Brandt, Philip W.....	270	Bull, Sherman M.....	262, 286
Birman, Hector I.....	261	Bransilver, Belinda	258	Bullock, Samuel C.....	282, 284
Bishop, David H. L....	264, 272, 287	Branwood, H. Whitley	278	Bundrant, T. Mitchell	290
Bissell, LeClaire	254, 274	Braun, Carl W.....	256, 275	Bunge, Mary B.....	270
Bito, Laszlo	277	Bray, Bonnie A.....	271	Bunge, Richard P.....	270
Bjorklund, Paul R.....	290	Bray, Richard C.....	271, 277	Bunzel, E. Everett	252
Blabey, Jr., Robert	262	Brennan, Jr., John T.....	287	Buonano, Aurelio	284
Blackwood, Carlton E.....	275	Brensike, John F.....	254	Burch, Robert E.....	272
Blair, Charles R.....	287	Breener, Richard W.....	286	Burgher, Clarence M.....	286
Blake, Melvin N.....	278			Burny, Arsene	287

PAGE	PAGE	PAGE
Burris, John O.....253, 272	Chan, James C.....259	Cohen, Milton.....282
Burvill, Peter W.....283	Chandler, Boris C.....262	Cohen, Roger D.....262
Bush, Jr., Harry L.....262	Chang, Chu Hwai.....261, 285	Cohen, Selwyn A.....255
Butler, Jr., Vincent P.....253, 272	Chang, Charlotte.....281	Cohen, Sidney M.....255, 275
Button, Jr., William H.....274	Chang, Hai Won.....275	Cohen, Solomon J.....258, 279
Butts, Hugh F.....284	Chang, Min-Tang.....252	Cohen, Stephen R.....254
Byrne, John C.....262	Chao, Solan.....256, 276	Coigney, Rodolphe L.....282
Bysshe, Stanley M.....240, 256, 264, 276	Chargaff, Erwin.....264, 271	Colcher, Henry.....254, 273
Byyny, Richard.....254	Charlton, Maurice H.....255, 262, 275	Cole, James R.....257
Caffey, John.....252, 270	Chauhan, Prem M.....258	Cole, Raymond M.....257, 278
Cahn, Lester R.....253, 270, 279	Chawla, Santos.....258	Cole, Robert M.....291
Cain, Jr., Edward A.....266, 267, 290	Chen, Bei-Loo.....270	Coleman, D. Jackson.....257, 277
Caldwell, Peter R. B.....253, 272	Chen, Chiou-Chiang.....262	Coleman, Louise.....283
Califano, Paul F.....260, 283	Chen, Kwan-Hwa-Marne.....288	Collard, Jean E.....273
Callahan, Mary E.....264, 286	Cherkasky, Martin.....282	Collette, Patricia J.....282
Calvin, Harold.....272, 288	Cherrick, Gilbert R.....254, 274	Collins, Allen H.....260
Cameron, Elliott N.....282	Chertoff, Harvey R.....260	Collins, James U.....252
Cameron, Airlee A. C.....274	Cherubin, Charles B.....282	Collins, Martha.....259
Campbell, Charles J.....257, 277	Chess, Leonard.....254	Colman, J. Douglas.....282
Campbell, M. Edwina.....254, 273	Chetty, Anbukili K.....259	Colmore, Henry P.....254, 273
Campbell, Milton F.....257, 277	Chiang, Han-Twu.....252	Colombotos, John L.....281
Campbell, Robert G.....281	Chien, Kuang Chung Hu.....273	Comas, Arsenio.....256
Campbell, Robert J.....283	Chien, Shu.....280	Conan, Neal J.....254, 273
Campbell, William L.....261	Chilton, Neal W.....281, 291	Conklin, Edward F.....286
Canfield, Robert E.....253, 264, 272	Chiou, Ming Chuan.....252	Conley, John J.....257, 277
Cannaday, Royall G.....255	Chisholm, Dan P.....261	Converse, George M.....259
Cannon, Joe H.....280	Choy, Daniel S. J.....254, 273	Cook, Diana C.....284
Cannon, Paul J.....253, 272	Christakis, George J.....282	Cook, John A.....259, 283
Cannon, W. Dilworth.....257	Christian, Charles L.....253, 272	Cook, Stuart D.....256, 275
Cantor, Herman.....291	Christmas, June J.....284	Cooper, Arnold M.....283
Cantor, Murray A.....290	Christy, Nicholas P.....254, 264, 274	Cooper, Barry C.....292
Carberry, David M.....287	Chu, Luke S. W.....261, 285	Cooper, Jr., George W.....264, 270
Carbonara, Peter N.....277	Chui, David H.-K.....255, 272	Cooper, Henry S. F.....261
Carden, Jr., George A.....253, 272	Chuk, Shik Kei.....252	Cooper, William C.....257, 277
Cardona, Hernando.....277	Chusid, Erwin L.....254	Copenhaver, Wilfred M.....270
Carey, Jr., Edward J.....286	Chusid, Joseph G.....255, 275	Coppersmith, Harold H.....274
Carmel, Peter W.....255, 262, 274, 288	Chutorian, Abe M.....255, 275, 279	Corbin, Eustace E. S.....286
Carmical, Neville W.....257	Cinelli, Peter B.....262, 286	Corbitt, Theodore.....286
Caronia, Victor S.....291	Cinque, Salvatore G.....286	Corcoran, Paul J.....261, 285
Carpendale, Michael T. F.....261, 285	Cinquina, John E.....292	Cordery, Joy.....285
Carpenter, Malcolm B.....255, 264, 265, 270	Cizek, Louis I.....280	Cordier, Andrew W.....264, 266
Carr, Arthur C.....283	Clark, Graham.....256, 277	Cordova-Ferrer, Getsy.....253
Carrión, Arturo L.....272	Clark, Irwin.....271, 277	Corey, Karin, R.....285
Carroll, Frank D.....257, 277	Clark, Robbin.....265	Correll, James W.....255, 274
Carroll, Robert E.....257, 277	Clark, Robert.....254	Corley, Glenna J.....278
Carter, Rodman D.....286, 287	Clark, Wilder C.....283	Corsaro, Louis A.....259
Carter, Sidney.....240, 255, 264, 275	Clarke, Benjamin K.....271	Cosgriff, Stuart W.....253, 272
Casarella, William J.....261	Clarke, Hans T.....270	Cosla, Horace W.....285
Casat, Charles D.....260	Clay, Clement C.....280	Cosman, Bard.....262, 264, 286
Casazza, Albert R.....274	Cleary, Constance P.....275	Coss, Jr., James A.....254, 273
Case, Robert B.....254, 274	Cleveland, Mather.....252	Costa, Joseph A.....258
Casey, Murray.....256	Co, Cayetano C.....261	Costantin, LeRoy C.....280
Cassebaum, William H.....287	Co, Denis Y. C. Lynn.....281	Cote, Lucien J.....256, 275
Cassuto, Era.....271	Coates, Edward D.....282	Cotter, Lawrence H.....254
Cattell, James P.....259, 283	Cocchiarella, Antonio.....261, 285	Cotton, John.....284
Cavanagh, William V.....256	Co-Chan, Catalina.....252	Countee, Roger W.....262
Cave, Herbert G.....264, 271	Cochran, George Van B.....277	Cournand, Andre F.....252, 270, 273
Cederbaum, Alvin D.....291	Coelho, Jaine B.....273	Coward, Joe E.....274, 275
Cederquist, John W.....259, 283	Coen, Stanley J.....260, 284	Cowen, David.....258, 275, 278
Cesar, Reynold.....252	Coffery, Jr., Edward L.....258, 278	Cowen, Norman J.....257
Challenor, Bernard D.....282	Cohen, Gerald.....283	Cox, Ila S.....276
Challenor, Yasoma B.....261, 285	Cohen, Harry.....252, 271, 276	Coyne, James J.....254, 273
Chaitman, Edmund.....260	Cohen, Harvey R.....282	Craig, Frederick S.....257, 277
	Cohen, Max P.....283	Cramer, Fritz J.....252
	Cohen, Michael H.....254, 273	

PAGE	PAGE	PAGE
Crandell, DeWitt L....259, 281, 283	De Lisi, Joseph C.....291	Dougherty, Louis J....262, 287
Cranefield, Paul F.....280	Dell, Ralph B.....258, 279	Dow, Lois
Crawford, Mary I. 240, 249, 264, 265, 275	Dellenbach, Robert J.....280	Dowling, Peter C.....256, 275
Crespin, Stephen R....255, 273	DelMar, Margaret249	Downey, John A.....261, 285
Crikelair, George F....241, 261, 286	Demarest, Robert J.....270	Downing, Edward F.....255
Crompton, Thomas F.....252	Demartini, Felix E....253, 264, 272	Downs, Elinor F.....280
Cropper, Jean B.....282	Dempsey, Edward W. 264, 265, 266, 270	Driscoll, Rose A.....276
Crowley, Robert E.....292	deNapoli, Robert A.....255, 275	Driscoll, Yvonne T.....258, 279
Crupi, Claudio	Denckla, Martha B.....256	Driscoll, Jr., John M.....258, 279
Cuckler, Ashton C.....281	Denning, Carolyn R.....258, 279	Drusin, Ronald
Culleton, James F.....256, 275	Denton, John R.....257	Druss, Richard
Cunnick, William R.....273	Derby, Bernice R.....275	Duane, Jr., Richard B.....254, 273
Cunningham, James K....254, 273	deRoeth, Jr., Andrew.....257, 277	Dubo, Hyman C.....261
Curl, M. Diane.....290	Derrick, John B.....281	Dubovy, Carl
Curnen, Jr., Edward C. 240, 258, 262, 264, 265, 279	DeSanctis, Peter N.....262, 287	Duc, Gabriel V.....259, 279
Curran, George L....240, 253, 272	DeSeipio, Frank J.....282	Ducey, James
Curth, Helen O.....253	D'Esopo, D., Anthony.....240, 252, 270	Ducker, Paul J.....260
Curth, William	Deutsch, Adelaide A.....285	Duffy, Philip E.....258, 275, 278
Curtin, William	Deutsch, Stephan D.....262	Duke, James H.....262, 286
Curtis, Paul	DeVoe, Arthur Gerard 240, 256, 264, 265, 277	Dullemeijer, Pieter
Cushman, Paul	Devlin, Miriam A.....261	Dunham, C. Dary.....254
Cuttita, Joseph A....253, 266, 267, 292	Devlin, Raymond J.....284	Dunnington, John H....240, 252, 270
Cynkin, Simme	DeVore, Jay S.....253	Dunton, Harlow D.....259, 283
Daglian, Kourken A.....253, 290	Dexter, David D.....271	Duvoisin, Roger C.....255, 275
Daley, John M.....254, 273	Diamond, Leonard	Dvoskin, Samuel
D'Alton, Clarence J.....253, 273	Diamond, Oscar K.....284	Dwyer, Edward M.....274
Dalton, Dennis	Dicello, John F.....285	Dyer, William R.....256
Daly, John J.....255	Dick, Frederick S.....262	Dyrenfurth, Inge
Dammann, Gloria L. A....281	Dick, Harold M.....257, 277	Eakins, Kenneth E.....277
Damon, Virgil G.....252, 276	Dickinson, Ruth	Earle, Anna M.....264, 275
Damrosch, Douglas S. 258, 264, 265, 279	Dickinson, Seldin J.....286	Easser, B. Ruth.....282
Daniel, Salha S.....271	Dickson, Donald G.....281	East, Bion R.....252, 270
Daniels, George E.....252	Dicmonas, Elsi J. G.....285	Ebel, Harvey C.....275
Danoff, Dudley S.....262	Diener, Harry	Eberle, Robert C.....257, 277
Darling, Robert C. 240, 261, 264, 265, 285	Di Giacinto, Robert.....256	Eckhaus, Morris
Darrell, Richard W.....257, 277	DiGrande, Elaine V.....253	Edelen, John S.....255
Das, Ramacaadran	DiJohn, John C.....274	Edmunds, Robert T.....287
Davidson, Arthur T.....286	Dillenberg, Stanley M.....255, 275	Edreira, Juan G.....273
Davidson, David B.....262, 286	Dillon, Donald J.....283	Edsall, John R.....274
Davidson, Ezra C.....276	Dilworth, Agnes D.....273	Eftekhar, Nasseroddin
Davidson, Henry A.....282, 284	Di Mango, Anthony L.....290	Eggena, Peter
Davis, Elizabeth B....259, 264, 284	Dinin, Benjamin G.....282	Egri, Gladys
Davis, Hayes H.....258	DiRe, John J.....279	Ehmann, Virginia
Davis, John S.....273	Dirkmaat, Joan M.....276	Ehrlich, Gabriele
Davis, Samuel	DiSalvo, Nicholas A....266, 267, 291	Ehrlich, Richard M.....262
Day, Robert McC.....257, 277	Dische, Zacharias	Einbinder, Julia M.....272
Dayan, Jean	Djaldetti, Meir A.....255	Eisenberg, Max A.....264, 271
Deakins, Susan M.....254	Dobbs, Leland G.....255	Eisenbud, Leon
Deal, Walter J.....275	Dohrenwend, Bruce P.....280, 283	Eisenstein, T. Donald.....258, 279
Dean, John van B.....253, 273	Domonkos, Anthony N....253, 272	Eisert, Jack
DeBellis, Robert H....254, 273, 287	Donaldson, Kenneth T.....274	Elftman, Herbert O.....270
Decker, Elisabeth B.....259	Donham, Robert T.....252, 271	El-Hawary, Saad E.....256
Deesen, Kenneth C.....290	Donkersloot, Jacob A.....274	Elinson, Jack
Defendini, Richard F.....256, 278	Donn, Anthony	Elliott, Jr., Robert H. E. 249, 261, 264, 265, 286
DeFries, Zira	Donnenfeld, Hyman	Ellis, Kent
DeHaan, Clayton R.....287	Donovan, Edward J.....252	Ellner, Paul D.....255, 274
DeHirsch, Katrina	Donovan, John V.....292	Ellsworth, Robert M.....257, 277
Deitch, Arline D.....274, 278	Donovan, J. Timothy.....262, 287	Elvove, Robert M.....260
DeJulia, Joseph A.....291	Donovan, Ruth U.....258, 280	Ely, Charles A.....264, 270
Delbanco, Thomas L.....274	Donovan, William R.....281	Emmers, Raimond
	Dorros, Gerald	Enderle, Erna S.....254
	Dotti, Louis B.....282	Endicott, Jean

PAGE	PAGE
Engel, Knud	279
Engel, Tibor	256
Enson, Yale	254, 273
Epstein, Neil B.	291
Epstein, Ralph A.	252, 271
Epstein, Robert M.	252, 264, 271
Epstein, Stefan E.	278
Erganian, Jane A.	259, 279
Erhardt, Carl L.	281
Erv, Alfred	292
Erlanger, Bernard F.	274
Erlenmeyer-Kimling, Loise	283
Eryol, Azak S.	279
Esan, George J. F.	255
Esecover, Harold B.	260, 284
Espy, John W.	257, 277
Esselstyn, Cadwell B.	282
Esser, Robert A.	256
Estes, Dorothy	254, 273
Estrin, Elisabeth G.	259, 279
Etess, A. David	260
Etra, Bernard	259, 280
Evans, Hugh E.	258, 280
Evans, Robert W.	283
Exconde, Jr., Felix V.	256
Exelby, Walter P.	262, 286
Factor, Morris M.	259
Fadil, Richard	262, 287
Faggella, Francis J.	290
Farhangi, Mehdi	278, 287
Farkas, Tibor	283
Farrer, Sanford M.	279
Farris, Robert L.	257, 277
Fasy, Thomas M.	258
Faverio, Charles D.	254, 273
Feder, Lewis	256
Feder, Samuel L.	284
Feigelson, Eugene B.	284
Feigelson, Muriel	272, 276
Feigelson, Philip	271, 287
Feinberg, Alfred	278
Feinberg, Arthur	254, 273
Feinberg, Gerald L.	252, 271
Feind, Carl R.	261, 286
Feinerman, Lois A.	253
Feinsmith, Burton M.	259, 280
Feinstein, Robert P.	253
Felch, William C.	254
Feldman, Bernard R.	258, 279
Feldman, Frieda	261, 285
Feldman, Matthew	259
Felix, Marie D.	270
Felton, Charles P.	273
Felton, Hiroko T.	276
Fenoglio, Cecilia M.	258
Fenoglio, John J.	258
Fenton, Arnold N.	256, 276
Fercnczy, Alex	258
Ferin, Michael	276, 288
Ferrebe, Joseph W.	273
Ferrer, Jr., Jose M.	261, 286
Ferrer, M. Irené	253, 272
Fertig, John W.	260, 280
Feuer, Charles R.	261, 285
Fiasconrao, Joseph E.	290
Fidler, Gail S.	285
Field, William W.	254, 274
Fields, James P.	272
Fields, Martin J.	292
Fierer, Joshua	258
Fieve, Ronald R.	259, 283
Finby, Nathaniel	285
Findlay, Jr., Charles W.	261, 286
Fine, Charlotte M. R.	285
Fine, Susan B.	285
Fingerhut, Bruno	287
Finison, Lorenz J.	288
Fink, Louis	258, 278
Finke, Stanley R.	274
Finkel, Jerry R.	260
Finkelstein, Ludmila S.	261, 285
Finn, James E.	256
Finster, Mieczyslaw	252, 271
Firdman, Marvin N.	290
Firestein, Allan L.	290
Firestein, Stephen K.	283
Fischel, Edward E.	254, 272
Fischman, Hallow K.	277
Fish, George W.	240, 252, 270
Fisher, Andrea L.	275
Fisher, Anita	284
Fisher, Joseph	262
Fisher, Lloyd G.	254, 273
Fisher, Pearl R.	282
Fisher, Peter B.	259
Fisher, Robert L.	291
Fishler, Lois A.	260
Fishman, Lawrence S.	256
Fisk, Shirley C.	253, 264, 265, 272
Sister Antony Marie (Fitzmaurice)	282
Fitzpatrick, Hugh F.	287
Flack, J. Vincent	257
Flapan, Mark	281, 283
Flavia, John A.	292
Fleck, Jr., Andrew C.	282
Fleiss, Joseph L.	281
Fleming, Thomas P.	264
Flint, James F.	255
Flood, Charles A.	240, 253, 265, 272
Fogel, Gerald I.	260, 284
Fogelberg, Earl V.	257
Fogelman, John A.	259
Foley, Archibald R.	259, 281, 283
Foley, Bethanne	259
Follett, David A.	261
Forbes, Max	257, 277
Ford, Jr., Douglas	259, 279
Ford, Edna K.	282
Ford, Joseph	287
Forde, Kenneth A.	262, 265, 286
Forester, Bruce	260
Forrest, Arnold W.	257, 277
Forstenzer, Stephen L.	282
Forster, Eugene S.	260, 283
Foster, Goodwin L.	270
Foster, Pearl D.	274
Foster, Robert	257
Foster, Stanley C.	261
Fox, Jr., Charles L.	274, 286
Fox, Lavinia G. M.	258
Fragola, Louis A.	272
Fragoyannis, Stylianos G.	278
Frame, John D.	281
Frances, Jr., Allen	260
Franciscus, Marie L.	285
Francois, Egel	286
Frank, Judith E.	259, 280
Frank, Kenneth	283
Frank, Marjorie H.	281
Frankel, Olga	260, 283
Franklin, C. Ray	257
Franklin, David N.	259, 279
Frantz, Andrew G.	253, 272
Frantz, Angus M.	252
Fraser, Richard A. R.	255
Fraser, Robert W.	287
Frazier, Shervert	259, 264, 265, 282
Freida, Vincent J.	256, 276, 278
Freeman, Harold P.	286
Freeman, Mahlon V.	256
Frick, II, Henry Clay	256, 276
Friedberg, Eugene A.	260, 283
Friedberg, Michael A.	262
Friedman, Arnold P.	255, 275
Friedman, Jr., Edward A.	254
Friedman, Paul A.	255
Friedman, Richard C.	260
Friedrich, Rudolph H.	253, 266, 267, 290
Fritts, Jr., Harry W.	253, 264, 272
Fritz, Herbert P.	296
Fu, Yao-Shi	258
Fujikawa, Denson G.	262
Fujimura, Shingi	287
Fukunaga, Atsuo	271
Fuld, Stuart L.	261
Fullerton, William W.	271
Furey, Clement A.	262, 287
Furman, Sylvan S.	282
Furst, Arthur	278
Furth, Jacob	270, 279
Gabriel, James B.	274
Gabriele, P. Charles	291
Gaerlan, Pureza F. M.	259, 279
Gaetz, Harold P.	279
Gallinek, Alfred	255
Galloway, Shelby	261
Galton, Harry A.	291
Galton, Robert	281
Gambino, S. Raymond	258, 278
Gamboa, Eugenia	256
Garber, C. Zent.	258, 279
Garcia, Alexander	257, 262
Gardner, Lee R.	260, 284
Gardner, Penny A.	259
Gardner, Richard A.	260, 284
Gardner, Robert A.	262
Garitano, William W.	260, 284, 287
Garnes, Arthur L.	286
Garnes, Harold A.	287
Garret, Rudolph	279
Garrett, Alice L.	277

PAGE	PAGE	PAGE			
Garst, Walter P.....	286	Goldberg, Max	284	Green, Arthur H.....	260, 284
Garvey, Glenda J.....	255	Goldberg, Morrell	282	Green, David	257
Gaston, Sawnie R.....	257, 277	Goldburg, Mark	275	Greenbaum, Lowell M.....	264, 280
Gasway, Robert M.....	252	Golden, Ross	252, 270	Greenberg, Abraham	290
Gates, Marguerite J.....	258, 279	Goldenberg, Norbert	282	Greenberg, Carolyn	253
Gates, Maurice A.....	276	Goldenberg, Robert L.....	256	Greenberg, Saul N.....	290
Gause, Ralph W.....	276	Goldensohn, Eli S.....	255, 275	Greenberg, Susan	276
Gavis, Gustave	259, 279	Goldensohn, Sidney S.....	256	Greenberger, Robert A.....	252
Gaylin, Willard M.....	283	Goldfarb, William	259, 284	Greenblatt, Irving J.....	281
Gearing, Frances R.....	281	Goldin, Gurston D.....	260, 283	Greene, Edward L.....	283
Geiger, Arnold M.....	291	Goldin, Joel	291	Greene, Lynne T.....	252, 264, 271
Gelband, Henry	259	Goldin, Victor	260, 283	Greenfield, Edward	290
Gelbard, Hyman	259, 280	Goldman, George	282	Greenfield, William	290
Gelber, Rene L.....	262, 286	Goldman, Jack J.....	281	Greenspan, Kenneth	260
Gelfand, Michael L.....	262, 286	Goldreyer, Bruce N.....	255, 273	Greenspan, Stanley I.....	260
Geller, Lester M.....	278	Goldsmith, Charles I.....	258	Grey, Ross M.....	278
Gelman, Anna G.....	281	Goldstein, Irwin	254	Gribetz, Donald	259
Gerbi, Claudio	254, 273	Goldstone, Jonas M.....	254, 274	Grieco, Michael H.....	254, 274
Gersony, Welton M.....	258, 279	Goldwater, Leonard J.....	270, 282	Griffin, William M.....	261
Gerst, Paul H.....	262, 286	Gollance, Harvey	282	Griffiths, Sylvia P.....	258, 279
Giardina, Elsa	255	Gollub, Edith	271	Grinker, Rachel M.....	288
Gibbon, John	283	Goltzman, David	255	Grinnell, Robert S.....	261
Gibbs, Barbara C.....	284	Gongaware, Robert D.....	262, 286	Grode, Marshall L.....	255
Gibson, Edward L.....	252	Gongaware, Theodora L.....	255	Gripekoven, Price	257
Gidro-Frank, Lothar	259, 283	Gonzalez, Frank W.....	285	Grokoest, Albert W.....	254, 273
Gilbert, Gay F.....	276	Goodbody, Maurice F.....	274	Gross, Paul	252
Gilbert, Gloria H.....	276	Goode, Louise A.....	274	Gross, Stanley	278
Gilbert, Louis J.....	260, 283	Goodman, DeWitt S.....	253, 272	Gross, William	285
Gilbert, Jr., Stanley H.....	259, 279	Goodman, Edmund N.....	261, 286	Grossbard, Lionel	254, 273
Gilder, Jr., Rodman	260, 283	Goodman, Fredric E.....	290	Grossman, Bernard L.....	261, 285
Gill, Elizabeth S.....	270	Goodman, Irving	271, 286	Grossman, Bertram H.....	259, 279
Gillespie, Horace B.....	271	Goodman, Jerome	260, 284	Gruenberg, Ernest M.....	259, 280, 282
Gilman, Sidney	256, 264, 275	Goodman, Leon J.....	285	Grunberger, Dezider	287
Ginard, Antonio	253	Goodman, Reba M.....	278	Grundfest, Harry	275
Ginsberg, Sara	275	Goodman, Robert L.....	255	Gruner, George	256
Ginsburg, Iona H.....	284	Goodman, Sam L.....	260	Guarin, Urbano K.....	287
Gissen, Aaron J.....	252, 271	Goodman, Soll	260, 283	Guicherit, Iwan D.....	281
Gitman, Leo	282	Goodman, Stephen F.....	291	Guinee, Vincent F.....	281
Giuliani, Edoardo	286	Goodwin, Frank J.....	255	Gump, Frank E.....	261, 286
Givan, Jr., Thurman B.....	258, 279	Goodwin, Paul N.....	285	Gurewitsch, A. David	252, 285
Gladstone, Wilma	256	Gordon, I. Bruce	259, 280	Gurian, Harvey	284
Glasel, Jay A.....	271	Gordon, Wally	271	Gurin, Lawrence R.....	291
Glaser, Stephen	259	Gorman, John G.....	258, 278	Gurland, Barry J.....	283
Glasgold, Alvin I.....	257, 277	Gottsegen, Irving	282	Gutenstein, Beulah	282
Glass, Leonard	258, 280	Gottsegen, Robert	266, 267, 291	Guthie, James R.....	258, 279
Glassman, Alexander H.....	260	Grace, Russel R.....	262	Gutman, Alexander B.....	273
Glavin, Richard J.....	284	Grady, Frank J.....	257	Guttmann, Ruth J.....	285
Glenn, Michael	260	Graff, Ada M.....	271	Haagensen, Cushman D.....	
Glick, Alvin J.....	260, 284	Graff, Samuel	271	Haber, Martha E.....	252, 270, 286
Glick, B. William	270	Graham, Fiona	260, 284	Haberman, Paul W.....	275
Glick, John H.....	255	Graham, George W.....	282	Habif, David V.....	261, 286
Glick, Robert A.....	260	Granato, Robert	287	Haffner, William H.....	256
Gliedman, Monroe M.....	291	Grandin, Dean J.....	256, 276	Hagaman, Mary B.....	260
Gliedman, Richard	291	Grant, Edward V.....	282	Hagner, Dorothy K.....	276
Glusman, Murray	259, 283	Grant, H. Michael	284	Haldeman, Jack C.....	282
Gocke, David J.....	254, 273	Grant, Henry T.....	253	Hall, Eric J.....	285
Godman, Gabriel C.....	258, 274, 278	Grant, John P.....	262, 287	Hall, Robert E.....	256, 276, 287
Goff, Jeanne A.....	282	Grantham, S. Ashby	257, 277	Hallock, Halford	257
Gold, Aaron M.....	277	Granzen, Roderick A.....	254	Halpin, Thomas F.....	256
Gold, Allen M.....	271	Graves, Oscar N.....	271	Halvorsen, Gladys	260
Gold, Arnold P.....	256, 275, 279	Gray, Parke H.....	256	Hamada, Jatoshi	278
Gold, George	283	Grayson, Alvin J.....	291	Hamilton, Gerald L.....	256
Goldart, Natalie	281	Grayzel, Joseph	254	Hamilton, Jr., Lloyd A.....	260, 284
Goldberg, Ivan K.....	260, 284	Grebia, Burton	259, 279		
Goldberg, Mark A.....	256	Green, Albert	291		

PAGE	PAGE	PAGE
Jaeger, Roberta K.....260	Kapit, Hanna E.....282, 284	Kestenbaum, Clarice J.....260, 284
Jaffe, David260, 283	Kaplan, David291	Keydar, Yafa287
Jaffe, Joseph283	Kaplan, Gerald F.....262	Khambatta, Hoshang252
Jainchill, John L.....255	Kaplan, Jacob I.....291	Khanna, Shyam M.....278
James, L. Stanley.240, 258, 270, 279	Kaplan, Milton M.....277	Khella, Lewis261
James, Jr., William A.....257	Kaplan, Nathan261, 285	Khurana, Harijendra S.....291
Jameson, A. Gregory.....274	Kaplan, Neal L.....291	Kiechel, Frederic259
Jameson, Jean D.....283	Kaplan, Sidney286	Kietzman, Mitchell L.....283
Jampel, Robert S.....257, 277	Karch, Gary D.....252	Kilcoyne, Margaret M.....255
Janecka, Ivo257	Karel, Irving A.....291	Kildeberg, Poul A.....259
Jannetto, Louis B.....292	Karelitz-Karry, Marie253	Killian, Paul255
Jansky, Jeannette J.....279	Karis, Joannes H.....252, 271	Kim, Hie-Chui261
Jaretzki, III, Alfred.....261, 286	Karkas, John D.....264, 271	Kim, Sang M.....261
Jarvik, Lissy F.....283	Karl, William F.....271	Kimmey, James R.....281
Jasaitis, Joseph E.....262	Karlan, Frances R.....292	King, Donald L.....261, 285
Javert, Carl T.....276	Karlin, Arthur275, 280	King, Donald W.
Jenkins, Alva282	Karmiol, Mortimer292	240, 258, 264, 265, 266, 278
Jenkins, Jr., Farish A.....270	Karshan, Maxwell270	King, Marvin B.....291
Jennings, Robert E.....258, 279	Karten, Irving D.....256	King, Mary E.....278
Jensen, Philip B.....262	Karush, Aaron259, 283	Kinley, Aleta276
Jervis, George A.....259, 284	Kassel, Robert L.....271	Kinne, David W.....262, 286
Jesse, Mary J.....258, 279	Kastein, Shulamith278	Kinney, John M.....261, 286
Jewelewicz, Raphael .256, 276, 288	Katis, James G.....260, 284	Kinzel, Augustus F.....260, 284
Jewett, Frank283	Katsampes, Chris P.....259, 279	Kirschner, Corinne281
Johnson, Lewis A.....278	Katz, Abraham252	Kiriakopoulos, George C.....291
Johnson, Paul K.....254, 273	Katz, George M.....275	Kirsch, Roberta261
Johnson, Philip M.....261, 285	Katz, Ronald L.....252, 271	Kirschberg, Gordon J.....256
Johnson, Raymond F.....291	Katz, Solomon L.....291	Kister, Sven J.....262, 286
Johnson, Thomas A.....256	Katz, Stephen260, 284	Kitchin, Frank D.....272, 287
Johnson, Thomas H.....252	Katz, Vivienne285	Klastin, Bertram290
Johnston, Austin D.	258, 264, 277, 278	Klavins, James V.....278
Jones, Althea M.....286	Katzenstein, Michael279	Klein, Henriette R.....284
Jones, Barbara S.....273	Katzive, Julius A.....281	Klein, Susan288
Jones, Edgar A.....284	Katzman, Merle H.....277	Kleinberg, David255
Jones, Euclid253	Kauffman, John W.....282	Kleinman, Abraham M.....282
Jones, Ira Snow.....257, 277	Kaufman, Edward284	Klenk, Eugene258, 279
Jones, Julia B.....273	Kaufman, Mavis278, 283	Kline, Nathan284
Jones, Julia M.....253, 273	Kaufmann, Carole A.....275	Knapp, Philip257, 277
Jose, Jr., Alfredo Y.....262	Kaunitz, Hans254, 278	Knapp, Sally E.....281
Joselow, Morris M.....281	Kavaler, Florence281	Knaysi, George A.....262
Joseph, Julian J.....278	Kawai, Nobufumi275	Kneeland, Jr., Yale240, 252
Josephson, Eric281	Kawamoto, Jr., Henry K.....262	Kneeland, Yale270
Jovenich, Jaime J.....252	Kay, Ernest276	Knight, Katherine A.....275
Ju, David M. C.....261, 286	Kaye, Gordon I.....278	Knipe, Mary K.....276
Juhlin, Einar A.....253, 272	Kayman, Harvey259	Knippenberg, Ruth E. B.....285
Justice, Michael W.....262, 287	Keating, Jr., John H.....274	Knowlton, Abbie I.....254, 272
Justman, Daniel260, 284	Keating, Richard P.....274	Knowlton, Jeanette276
Kabat, Elvin A...255, 272, 274, 275	Keenan, Richard271	Knox, W. Graham287
Kagen, Lawrence J.....254, 272	Keill, Stuart L.....260, 284	Koehler, Judith P.....256
Kahn, Erich258, 280	Keim, Hugo A.....257, 277	Koenigsberger, Richard M.256, 275
Kahn, Norman264, 266, 280	Keller, Jean284	Kohl, Schuyler G.....282
Kaimakliotis, Elias M.....254, 273	Keller, Stephen276	Koike, Katsura259
Kaiser, Gerard A.....261, 286	Kellerer, Albrecht M.....285	Kolb, Lawrence C.
Kalbacher, Joseph E.....258, 279	Kellogg, Marjorie285	240, 264, 265, 282
Kamm, Ronald L.....260	Kelly, Gordon R.....257	Kolody, John T.....282
Kammerman, Sandra255	Kelly, William G.....277, 280	Kopeloff, Lenore M.....283
Kandle, Roscoe P.....282	Kendall, Forrest E.....270, 271, 273	Koplun, Burton S.....253
Kane, Rosamond257, 277	Kennedy, James A.....255, 273	Kornfeld, Donald S.
Kangos, John J.....259, 279	Kennedy, Lucy R.....264, 275	240, 259, 264, 283
Kanter, Donald M.....254, 273	Kennedy, William R.....257	Kornfeld, Paul292
Kanter, Ira E.....261, 264, 285	Kent, Louisa M.....276	Kosnick, Edward J.....262
Kantor, Martin260	Kerst, Richard N.....282	Kossmann, Richard J.....257
Kanzler, Maureen B.....284	Kesselbrenner, Israel284	Koster, Seymour291

PAGE	PAGE	PAGE			
Kowarski, Szloma	280	Laury, Gabriele V.	260, 284	Lindaman, Francis C.	281
Krakoff, Lawrence R.	255	Lawler, H. Clair	283	Lindenbaum, John	254, 265, 272
Kramer, Fred R.	287	Lawrence, Margaret M.	284	Lindig, George F.	290
Kramer, Theodore	257	Lax, Henry	254, 273	Lindsay, Margaret J.	281
Krant, David A.	257	Lazar, Norman David	259, 283	Lindo, J. Trevor	284
Krasna, Alvin I.	271	Lazachek, Gary W.	258	Lingley, James F.	261
Krause, Jr., John L.	262, 286	Leader, Robert	278	Linn, Louis	282, 284
Krehbiel, Susannah	260	Leahey, Edward B.	277	Linz, Andrew M.	290
Kreisman, Dolores E.	283	Leavitt, Joseph M.	266, 267, 290	Lipman, Marvin M.	254, 273
Kremzner, Leon T.	271, 275	Leblanc, Wiener	280	Lipow, Walter I.	291
Krenis, Lawrence J.	253	LeBourhis, Elizabeth E.	280	Lipton, Brian P.	260
Krieger, Jerome	261	Leddy, Joseph P.	257	Lipton, George M.	252
Kritzler, Robert A.	254, 271	Lee, Arnold St. J.	271	Lisio, Arnold L.	254, 273
Kronman, Barry S.	257	Lee, Jr., Arthur B.	262	Lissenden, Carolkay L.	259, 280
Krugman, Robert	261	Lefer, Leon	260, 284	Littler, J. William	287
Kuehner, Charles R.	262	Lefkowitz, Lawrence A.	257	Littman, Julius K.	270
Kuhn, Robert A.	257	Lefkowitz, Nathan	284	Lituchy, Stanley	260, 283
Kumler, Fern R.	276	Lefrak, Stephen S.	255	Liu, Letty M.	253
Kun, M. Susan	275	Legato, Marianne J.	274	Liu, Philip L.	253
Kunnes, Richard	260	Leidy, Grace A.	279	Livingston, Gideon E.	280
Kuo, Betty Chi Mei Lee	280	Leifer, Edgar	253, 272	Livingston, Peter A.	261
Kuo, Nicetas H.	282	Leiter, Naomi	260, 284	LiVolsi, Virginia	258
Kupchik, George J.	282	Leland, James L.	254, 273	Lloyd, Kenneth O.	271, 272
Kurokawa, Kenneth M.	257	Lennon, Jr., Arthur J.	254, 274	Lloyd, Putnam C.	253
Kusch, Polykarp	264, 266	Lennon, Richard G.	257	Locke, Kenneth	260
Kuske, Terrance T.	254, 273	Lenz, Maurice	252, 270	Lockshin, Michael D.	255
Kutner, Philip	291	Lerner, Burton A.	260, 283, 288	Loeb, John N.	254, 264, 272
Kutscher, Austin H.	253, 266, 292	LeRoy, E. Carwile	254, 264, 272	Loeb, Robert F.	240, 252, 270
Labow, Theodore A.	253, 272	Leschey, Jr., William H.	256	Loewenfeld, Irene	277
Laderman, Peter	260, 283	L'Esperance, Jr., Francis A.	257, 277	Loewenstein, Regina	281
Ladopoulos, Constantine P.	254, 273	Lesse, Stanley	255, 275	Loewenstein, Werner R.	264, 280
Laidlaw, Arthur E.	280	Lesser, Stanley R.	283	Logerfo, Paul	262
Laird, Marion D.	256	Leuzzi, Anthony P.	284	Lombardo, Peter C.	253, 272
Lallemand, Roger	252	Levay, Alexander N.	260, 283	Lomeo, Alberto M.	276
Lamb, Jr., Albert R.	253, 262, 265, 272	Levenson, Barbara	281	Lonesome, Ronald B.	260
Lamb, Charles W.	283	Levi, Michael M.	276	Long, Calvin	286
Lambert, Adrian	287	Levin, Arthur L.	259	Long, Margaret E.	278
Lambert, John P.	259, 283	Levine, Jacob	282	Longo, Frank W.	262, 287
Lambert, Jr., Samuel W.	253	Levine, O. Robert	258, 279	Lord, Clyde O.	252, 271
LaMotte, Peter	287	Levine, Richard U.	256	Loscalzo, Louis J.	290
Landau, Stanley J.	262, 287	Levitian, Stephen J.	260, 284	Loughlin, Francis J.	291
Lane, Frederick M.	283	Levitt, Lawrence I.	284	Lovejoy, William P.	254, 273
Lane, Nathan	258, 278, 286	Levy, Louis I.	259	Lovelace, Robert E.	255, 275
Lang, Catherine I.	273	Levy, Magda	286	Low, Barbara W.	271
Lang, Robert R.	257, 278	Levy, Robert L.	252, 270	Low, Niels L.	255, 275, 279
Langer, Burton	291	Lewis, Jr., John L.	276	Lowell, Richard J.	290
Langford, William S.	258, 282	Lewis, John S.	278	Lowy, Samuel	260
Langmann, Alfred G.	252	Lewis, Linda	256	Lozzi, Virginia	260
Langner, Thomas S.	280	Lewis, Milean L.	274	Luban, Joseph	291
Lanks, Karl W.	258	Li, LuKu-	277	Lubart, Joseph M.	259, 283
Lantzounis, Leonidas A.	257	Li, Ronald	262	Lubchansky, Isaac L.	260
Lapkin, Michael L.	259	Liben, Florence G.	259, 281, 283	Lubell, Harry	259
Laragh, John H.	253, 272	Lichtenstein, Julia V.	254	Lucca, John J.	266, 267, 291
Larimore, Granville W.	282	Lieberman, Gerald	259, 280	Luckett, W. Patrick	270
Larson, Daniel L.	254, 273	Lieberman, Seymour	258, 271, 276	Ludwig, Arthur S.	258
Lasoff, Gustave	291	Liebert, Robert S.	260, 284	Luhrmann, Jr., George	260
LaSota, Eugene P.	291	Liebmann, Max	253	Luke, Wallace W. K.	285
Latta, William B.	253	Liegner, Leonard M.	261, 285	Lum, Gifford Y.	258
Lattes, Conrad G.	262, 286	Lifschitz, Martin I.	258, 279	Lunn, Joseph S.	273
Lattes, Raffaele	258, 264, 278, 286	Lifson, Sol S.	282	Luse, Sarah A.	270
Lattimer, John K.	240, 262, 264, 265, 287	Lightfoot, Robert W.	254, 273	Luttrell, Brian	288
Lauderdale, Jr., Vance	252, 271	Lin, Irene C.	253	Lutz, Julia A.	276
		Lin, Robert Chin-erh.	271	Lutz, Walter G.	261, 285
		Lind, John K.	292	Lyons, George V.	290
		Lind, M. Patricia	276		

PAGE	PAGE	PAGE
Lythcott, George I. 264, 265, 279, 281	Mandel, Louis 290	Meltzer, Jay I. 273
McAllister, Ferdinand F. 240, 261, 264, 286	Mandl, Ines 271, 276	Meltzer, Theodore 260, 284
McCabe, Robert E. 287	Manger, William M. 273	Mendelsohn, Frederick S. 283
McCaffrey, Raymond M. 256, 276	Mangum, Robert J. 282	Mendell, Jerry R. 258
McCann, Thomas O. 256	Mankoff, Mark R. 278	Menendez, Carlos E. 255
McCarthy, Joseph G. 262	Manning, Lucille D. 276	Menken, Matthew V. 256
McClane, Kenneth A. 273	Manski, Wladyslaw 274, 277	Meredith, Travis A. 255
McClement, John H. 253, 272	Marano, Anthony J. 274	Merker, Charles 262
McClenنان, Bruce 261	Marbach, Joseph J. 291	Merriam, Jr., George R. 241, 256, 262, 277
McCollester, Duncan L. 286	Marco, Luis A. 275	Merriam, Walter W. 255
McConnell, David J. 254, 272	Marcotte, Reo J. 282	Merritt, H. Houston 240, 264, 265, 266
McConville, Jane F. 275	Marder, Michael Z. 292	Merritt, Katharine K. 258
McCord, Colin W. 287	Margolin, Michael 256	Merritt, Milton P. 291
McCormack, Jr., George H. 254, 273	Marinovich, Mato L. 254, 273	Mertz, Philip 260
McCormick, George W. 259	Mark, Lester C. 252, 270	Mensnikoff, Alvin M. 284
McCormick, Miriam A. 276	Markee, Shirley J. 252, 271	Messer, Henry D. 275
McCray, Richard S. 274	Markowitz, Moshe 262, 287, 288	Metcalf, Kenneth M. 258
McCullough, Nancy 252	Markman, Ira 287	Mettler, Frederick A. 270, 275
McElroy, D. Keith 257, 277	Markowitz, Alfred M. 261, 286	Meyer, Karl 270, 271, 273
McFadden, Grace M. 282	Marks, Henry E. 254	Meyers, Donald I. 284
McGroarty, John J. 257	Marks, Paul A. 253, 264, 265, 272	Meyers, Helen C. 260, 283
McIntosh, Rustin 240, 252, 270	Marlow, Dorothy J. 259, 280	Michalke, Wolfgang 280
McKinney, John McD. 255	Marmer, Ellen 259	Michels, Robert 259, 283
McKinnon, Roger A. 264	Marolla, Francis A. 282	Michelsen, Christopher B. 262
McLain, Jr., Lee, W. 256, 275	Marquez, Cecil G. 273	Michelson, W. Jost 255
McLane, Kenneth A. 254	Marquit, Bela 257	Mickey, Rhoda M. 258, 279
McLaren, Donald S. 280	Martin, Dean N. 258, 279	Mignogna, Frank V. 257, 278
McLaughlin, Harrison L. 257, 277	Martin, Eugene M. 260, 283	Milici, John A. 260, 284
McLaughlin, Mary C. 282	Martinez, Leonor 261	Milikow, Edward 261, 285
McLaughlin, Richard C. 282	Marx, Alvin J. 278	Miller, Barnett M. 286
McLean, Patricia A. 266, 290	Masland, Mary W. 278	Miller, Dulcy 282
McLellan, William L. 278	Masland, Richard L. 240, 255, 264, 265, 275	Miller, J. Lowry 252, 272
MMahon, John A. 255	Maslansky, Manuel M. 290	Miller, Jacob D. 260
M Murtry, III, James G. 255, 264, 274	Mason, Richard C. 264, 280, 287	Miller, James 256
M Neill Christopher 255	Mason, Vaughan C. 276	Miller, III, John M. 261, 262, 264, 285
M Nulty, Edward C. 291	Massa, Enrique R. 259	Miller, Jordan 253
McSorley, III, John 253, 272	Masselink, Rollo J. 255	Miller, Louis H. 261, 281
Macarol, Veronika 255	Mast, Aimee S. 288	Miller, Orlando J. 256, 272, 276
Macdonald, Aildred A. 258	Mastroberete, Violet 276	Miller, Richard A. 282
MacDonald, James A. 287	Masurovsky, Edmund B. 270	Miller, Robert E. 287
MacDonald, Jeffrey 262	Mathers, James A. L. 254, 273	Miller, William 290
Maas, Anna G. A. 261, 285	Matseoane, Stephen L. 276	Miller, William J. 266, 291
Mackay, Mary C. 260, 283	Matteo, Richard S. 252, 271	Millet, John A. P. 259
Macken, Daniel L. 254, 273	Matthews, Joan H. 259	Mills, Donald R. 272, 287
Macken, Kevin L. 285	Mattison, Berwyn F. 282	Miner, Walter 286
Mackie, Robert W. 286	Mauro, Alexander 275	Minervini, George A. 290
MacKinnon, Roger A. 259, 262, 283	Max, Martin 262	Mintz, Beatrice 281
Maclean, Neil M. 260, 284	Maxwell, Teresita M. 276	Mintz, Ira L. 284
MacLean, William A. 255	Mayer, Gerda 274	Misheloff, Saul 292
MacLeish, Heather 259	Mayer, Harry J. 262	Mitchell, Doris J. 278
Mahoney, Elizabeth A. 276	Mayer, Shirley A. 258, 279	Mitchell, Jr., Walter L. 258, 279
Maines, Susan C. 275	Mayleas, Barbara G. 276	Miyoshi, Koho 275
Maier, Herbert C. 261, 286	Maynard, Aubre Del. 286	Mohammed, Noelo 276
Makinen, Marvin W. 258	Mee, Brian J. 271	Mohr, Brian 262
Maliepaard, Nora 275	Meiselas, Harold 284	Moldaver, Joseph 255
Malitz, Sidney 259, 282	Mekhjian, Haroutune 262, 286	Moley, Malcolm 286
Malkin, Stanley 256	Melcher, Jr., George W. 253, 272	Moller, Mary L. 277
Malm, James R. 261, 286	Melia, Daniel J. 258, 279	Monahan, David M. 291
Maloney, Milton C. 264, 265, 281	Melicow, Meyer M. 262, 270, 287	Monkcom, Wendy A. 253
Maloney, Paul K. 287	Mellana, Frank L. 290	Monroe, Janet I. 276
Mancusi-Ungaro, Pier 254, 273	Mellin, Gilbert W. 240, 258, 279	Montgomery, James W. 284
Mandel, Irwin D. 266, 291	Mellinger, James 256	Mook, William H. 273
	Mellins, Robert B. 258, 279	
	Meltzer, Herbert I. 254, 271, 283	

PAGE	PAGE	PAGE	
Moolten, Sylvan	278	Nastuk, William L.	280
Moore, Austin	260, 284	Natanblut, Faye C.	255
Moore, David B.	240, 256, 276	Nathanson, Bernard	291
Moore, Doris E.	282	Nauen, Richard	282
Moore, Gordon D.	257	Navarro, Carlos	258
Moore, Richmond L.	252	Nay, Howard	287
Moore, Sally A.	277	Neer, II, Charles S.	240, 257, 277
Moore, Thomas J.	258, 280	Neergaard, Arthur E.	253
Mora, George	284	Neiditch, Wilmore	257, 278
Moreinis, S. Abel.	290	Nelan, John J.	282
Morello, Josephine A.	274, 279	Nelson, Carl T.	240, 253, 262, 264, 265, 272
Morgan, Councilman	255, 274	Nemon, William J.	260
Morgan, Francis J.	255	Nesti, Frances R.	259
Morgan, Harry E.	261	Neu, Carmen O.	254
Moriarty, Patrick E.	261	Neu, Harold C.	254, 272
Morishima, Akira	258, 279	Neuberg, Hans W.	254, 273
Morishima, Hisayo O.	271	Neuwirth, Robert S.	256, 276, 288
Morley, Jr., Kenneth C.	262	Neviaser, Robert J.	257
Morlock, Noel L.	275	Newberg, Marc E.	254, 273
Morris, Andrew L.	252	Newman, George H.	258
Morris, Hennen C.	256	Ngai, Shih-Hsun	240, 252, 264, 270
Morris, Melvin L.	291	Nicholas, David D.	259, 280
Morris, Thomas Q.	254, 272	Nicholson, John F.	258, 279
Morse, Jane H.	254, 272	Nikias, Mata K.	281
Mortati, Saverio G.	260	Nisonson, Ian	262
Morton, Robert	286	Noback, Charles R.	266, 270
Moscarella, Alfred A.	287	Noble, Robert P.	254, 273
Moschides, Elly M.	279	Nocenti, Mero R.	266, 280
Moscovic, Edward A.	279	Noel, Gordon	255, 273
Moses, Leon	259, 283	Noonan, Richard J.	282
Mosher, Paul W.	283	Nord, Samuel G.	277
Moskow, Bernard S.	291	Nordsiek, Frederic W.	280
Moskow, Richard	292	Norman, David	261
Moss, Hugh M.	257, 277	Nosaka, Shoichiro	280
Moss, Leonard M.	260, 283	Nossell, Hymie L.	254, 272
Moss, Melvin L.	240, 253, 264, 266, 270, 290	Nova, Harvey R.	274
Mosse, Jonathan	286	Nowels, Anthony	260
Moulton, Ruth	283	Oakman, Carl S.	287
Mount, Lester A.	241, 255, 274	Oberhand, Robert I.	260
Mudd, John W.	260	O'Brien, John D.	260
Mueller, Lois A.	275	O'Brien, Joseph E.	278
Mufson, Isidor	254	O'Brien, Joseph L.	255, 275
Mulder, Martien	262	O'Connell, C. Paul	256, 276
Munnell, Equinn W.	256, 276	O'Connell, Daniel	281
Munsick, George	279	O'Connor, John F.	259, 283
Murphy, Eugene F.	291	Odrich, Ronald B.	291
Murphy, W. Linall	261	O'Grady, George L.	266, 267, 291
Murray, Margaret R.	270, 286	Okagaki, Takashi	264, 276, 278
Murray, Thomas M.	256	Oksenberg, Lois E.	283
Muto, Yasutoshi	255, 273	Olanow, Charles	256
Myerburg, Robert J.	254, 273	Oldham, John M.	260
Myers, Stanley J.	261, 285	Olds, David	260
Myerson, Daniel A.	261	Oliven, John F.	260, 284
Nachmansohn, David	270, 271, 275	Oliver, Jr., Caldwell H.	257
Nag, Moni	288	Olsen, John E.	286
Nahas, Gabriel G.	252, 270	Olsen, Paul T.	284
Nahoum, Henry I.	266, 291	Ollstein, Ronald N.	286
Naidorf, Irving J.	266, 290	Oman, Carl R.	252, 290
Nakamura, Masanobu	252, 271	O'Neill, Francis J.	282, 284
Nakazawa, Hiroshi	278	O'Neill, Margaret A.	286
Napc, William J.	260, 284	Opler, Stanley R.	278
Nash, Artemis D.	279	Oppenheimer, Armand M.	291
Nash, Lillian D.	256, 276	Ores, Celia	258, 279
253, 264, 265, 272			
260, 283			

PAGE	PAGE	PAGE
Perkins, Marvin E.....282	Presseller, Stephanie	285
Perkins, Ralph L.....282	Presser, Harriet	281, 288
Perkins, Richard P.....256	Price, Jr., John B.....261, 264, 286	
Perry, III, Samuel W.....260	Price, Raphael I. M.....262, 286	
Person, Ethel S.....284	Prichard, Elizabeth R.....272	
Person, Philip	Primack, Marshall	255
Perzin, Karl H.....258, 278	Priebet, Jr., Cedric J.....287	
Peters, Joseph P.....282	Priest, Allen E.....256	
Peters, Jr., Theodore	Pritzger, Henry A.....261	
Petrie, Roy H.....256	Prives, Joav	275
Petrinovic, Marco	Procupez, Theresa L.....255	
Petti, Michael J.....254	Pronko, Catherine T.....276	
Pettit, Helen F.....275	Prouty, Richard R.....274	
Pfeiffer, Raymond L.....256	Prudden, John F.....261, 286	
Phanor, Gilbert	Pryor, Austin K.....282	
Philbin, Daniel M.....252, 271	Puchner, Peter J.....262	
Phillips, Gerald B.....254, 274	Pulrang, Stanford	262, 287
Phillips, Louise L.....274	Purow, Henry M.....259	
Phillips, Paul E.....254, 273	Puszkin, Saul	275
Pianpiano, Jr., Joseph A.....290	Quash, Eugene	286
Pickens, Robert L.....262	Quencer, Robert	261
Pierre-Louis, Constant	Quimby, Edith H.....270	
Pierre-Louis, Jeany	Rachelson, Morton H.....258, 279	
Pierson, Jr., Richard N.....254, 274	Rachleff, Alan N.....252	
Pietri, Raul	Raciti, Katina A.....259	
Pimenidis, Margaritis Z.....291	Rackow, Herbert	252, 271
Pines, Kermit L.....253, 272	Radichevich, Ildiko	271, 273
Pino, Daniel M.....252, 271	Radkowski, Mary Ann	261
Piskacek, Vladimir R.....260	Raebeck, Jr., William	292
Pi-Sunyer, Francis X.....254, 274	Ragan, Charles A.....253, 264, 273	
Pitman, Gerald H.....262	Ragosta, Joseph M.....292	
Platman, Stanley R.....284	Rainer, John D.....259, 272, 283	
Platt, Mark	Rakic, Milovan T.....261, 285	
Plishner, Meyer J.....282	Ramaprasad, Rukmani	288
Plotnick, Hermine D.....285	Randall, Frederick R.....261, 286	
Plotz, Charles M.....254	Rankow, Robin M.....257, 277	
Poch, Herbert E.....258, 279	Ranz, Jules M.....260	
Poillon, William	Rapoport, Morris R.....254	
Polatin, Alvin H.....259, 283	Rappaport, Selma	283
Polatin, Philip	Rappleye, Willard C.....270	
Polk, Gene A.....280	Rapport, Maurice M.....271, 282	
Pollack, Arthur C.....256	Raskin, Raymond	283
Pollack, Donald O.....273	Raynor, Richard B.....255, 275	
Pollack, William	Raziano, Joseph V.....256	
Pollock, Edward J.....261	Reback, Samuel	255
Pomerance, Jeffrey J.....259	Reber, Robert	262, 286
Pons, Jr., Eduardo R.....254, 273	Redlener, Irwin E.....259	
Ponticorvo, Laura	Redler, Lance D.....257	
Pool, J. Lawrence	Reed, Donald R.....258, 279	
240, 255, 264, 265, 274	Reed, James R.....282	
Poppers, Paul J.....252, 271	Reese, Algernon B.....252	
Porter, Manuel J.....253	Regan, Ellen F.....257, 264, 277	
Porter, Milton R.....241, 261, 265, 286	Reich, Lester T.....253	
Porter, Vincent	Reichman, Lee B.....274	
Portway, Thomas W.....266, 290	Reiffel, James A.....255	
Poslusny, Elsa	Reifsnyder, David N.....281	
Post, Seymour C.....259, 283	Reilly, Edith B.....254, 273	
Postley, Jr., John E.....255	Reilly, Jr., James A.....261, 285	
Potter, Guy D.....261, 285	Rein, Joel M.....262, 286	
Potter, Harry R.....259, 284	Reindorf, Carl R.....280	
Potter, Reginald	Reiss, Robert R.....277	
Potters, Milton	Relland, John X.....262	
Prager, Kenneth M.....255	Renaudin, Justin W.....255	
Preisler, Harvey		
Prescott, Kathryn F.....259, 283		
	Renert, William	261
	Rennert, Morton C.....267, 291	
	Rettig, Arthur	262
	Reuben, John P.....275	
	Reyes, Cesar	271
	Reyes, Rodolfo L.....285	
	Reynolds, Ralph X.....288	
	Reza, Robert J.....255	
	Rheingold, Stephan R.....254, 273	
	Rice, Margaret M.....259, 279	
	Richards, Dickinson W.....252, 270, 273	
	Richards, Roderick C.....258, 279	
	Richardson, Arthur H.....278, 281	
	Richart, Ralph M.....258, 276, 278, 288	
	Richter, Paul L.....256	
	Richter, Ralph W.....256, 275	
	Ridley, Jeanne C.....281, 288	
	Rifkind, Richard A.....253, 264, 265, 272	
	Ripp, Norbert	290
	Rittenberg, David	253, 271
	Rittler, M. Catherine	277
	Rivera, Ramon J.....281	
	Rivlin, Richard S.....254, 272, 287	
	Rizkallah, Tawfik H.....276, 288	
	Robbins, Anne S.....260, 284	
	Roberts, Lloyd	279
	Roberts, Myron S.....240, 262, 264, 287	
	Roberts, Theophilus W.....264, 279	
	Robertson, Alexander	282
	Robinson, Alan G.....255	
	Robinson, John N.....262	
	Rochester, Dudley F.....254, 273	
	Rodgers, James B.....287	
	Rodgers, John M.....254, 273	
	Rodgers, Terry C.....260, 283	
	Rodosta, Frederick G.....262	
	Roe, C. Francis	262
	Rogatz, Peter	282
	Roginsky, Martin S.....254	
	Roglieri, John L.....255	
	Roistacher, Seymour L.....290	
	Rozin, Leon	278, 282
	Root, Walter S.....270	
	Rootenberg, Jacob	288
	Rosamilia, Jane DeA.....276	
	Rose, Harry M.....240, 253, 255, 264, 265, 266, 274	
	Rose, Judith S.....261	
	Roseboro, Anne H.....259	
	Rosen, Albert P.....258, 279	
	Rosen, David L.....255, 273	
	Rosen, Moshe	278
	Rosenberg, Arnold	291
	Rosenberg, Frederic R.....253	
	Rosenberg, Stanley E.....262, 287	
	Rosenberger, John W.....260	
	Rosenblum, G. Steven	260
	Rosenfeld, Barbara	260
	Rosenfeld, Eugene D.....281	
	Rosenkranz, Herbert S.....274	
	Rosenstein, Bernard	254
	Rosenstein, Solomon N.....253, 266, 267, 291	

PAGE	PAGE	PAGE
Rosenstock, Lynne L.....253	Savoy, William J.....253, 266, 290	Scudder, John261, 286
Roses, Allen256	Sawyer, Wilbur H.....280	Sealey, Jean E.....273
Rosmaita, John S.....259, 279	Scarff, John E.....252, 270	Seaman, William B.
Rosner, William254, 274	Scarff, Timothy255	240, 261, 264, 265, 285
Ross, Samuel M.....280	Scariever, Henry G.....278	Searles, Harold F.....284
Rossi, Harald H.....285	Scarola, John M.....291	Sebrell, Jr., William H.....280
Roswell, Charles G.....281	Scarrone, Louis A.....254	Seegal, Beatrice C.....270
Rothenberg, Fred290	Schachter, David264, 265, 280	Seegal, David252, 270, 273
Rothermel, Joel E.....257	Schaefer, Morris282	Segal, Barry M.....254
Rothermel, Robert E.....281	Schaeffer, Morris282	Segal, Martin E.....282
Rothman, Jeffrey258	Schaffeld, Henry G.....274	Segall, Harvey261
Rothman, Lewis M.....261	Scharer, Lawrence274	Seidel, Albin R.....252
Rothschild, Carl271	Schear, Myrna J.....256, 275	Seiden, Margaret R.....255, 275
Rothschild, Joel271, 288	Schenck, Robert R.....262, 286	Self, Edward B.....261, 264, 286
Rottenberg, Louis A.....261, 285	Schick, Alfred259	Selleck, Nathaniel254, 273
Roven, Robert B.....254, 274	Schick, Robert W.....287	Sellner, Henry A.....256
Royster, Thomas S.....287	Schiff, Robert N.....292	Sencer, David J.....282
Rozen, Jack H.....253, 272	Schilling, Fred J.....274	Seneca, Harry262, 287
Rubenstein, Harvey A.....255, 273	Schisza, Esther A.....281	Senitzer, David274
Rubenstein, Joel255	Schlaeger, Ralph G.....261, 285	Severinghaus, Aura E.....270
Rubin, David259	Schlesinger, Edward B.....255, 274	Severino, Lawrence J.....256, 276
Rubinstein, Leo283	Schlom, Jeffrey272, 287	Severud, Olaf J.....276
Rucker, Morton S.....260, 284	Schmidt, Donald H.....254, 273	Shaari-Tehrani, Mehdi278
Rudensky, George290	Schneider, Arthur L.....277	Shackelford, Hugh W.....261
Rudolph, Alan T.....253	Schneider, Jurg A.....280	Shade, Madelyn M.....276
Rugh, Roberts285	Schneider, Louis254	Shaines, Natalie284
Rush, David258, 279, 281	Schneider, Sanford256	Shalsha, Lilli C.....260, 283
Russell, Maurice V.....282	Schnitsky, Michael258	Shanahan, Sheila A.....259
Rutschmann, Jacques283	Schoenberg, Bernard B.....259, 283	Shands, Harley C.....284
Ryan, James H.....259, 283	Schoeneman, Bert B.....291	Shapiro, Daniel283
Ryan, Stephen279	Schoenfeld, Harvey282	Shapiro, Irving S.....281
Ryder, Charles T.....257, 277	Schoenfeld, Helen284	Shapiro, Joseph S.....253
Ryu, Kyuong H.....256	Schomer, Jesse260, 283	Shapiro, Lewis253, 272
Sabbia, Richard F.....278	Schonfeld, William A.....259, 283	Shapiro, Robert S.....283
Sachs, Howard270	Schore, Arthur260	Shapiro, Sam282
Sacks, Michael260	Schrag, Peter E.....274	Sharpe, Diane W.....276
Safirstein, Robert L.....259	Schreiber, Martin283	Sharpe, Lawrence283
Sagman, David L.....256, 275	Schroff, Julian291	Sharpe, Louis R.....290
Sahler, Otto D.....285	Schube, Daniel D.....290	Shattan, Boaz M.....253, 290
St. John, Fordyce B.....240, 252, 270	Schucman, Helen283	Shaver, Joyce C.....254, 274
Saland, Joel S.....259	Schuh, Frederic O.....262	Shaw, Anthony286
Salantire, Ernest252, 271	Schuker, Eleanor S.....260	Sheets, Sarah L.....275
Salentijn, Letty266, 270	Schulaner, Frederick A.....259	Sheinkopf, Harold N.....253
Salkind, Albert291	Schulman, Carol A.....284	Sheldon, Huntington277
Salvatore, Joseph E.....277	Schulman, Jay284	Sheldon, Paul B.....253
Salzinger, Kurt283	Schullinger, John N.....262, 286	Shelley, Eleanor V.....285
Salzinger, Suzanne284	Schuster, David S.....257	Shelton, Marvin L.....257, 277
Samios, Nicholas260, 284	Schutz, Gunther A.....287	Shen, Edith K.....259, 279
Sampath, Angus C.....274	Schvey, Malcolm H.....257, 277	Shen, Shih-Chang270
Sanaman, Michael L.....256	Schwartz, David T.....262	Shenkman, Samuel275
Sanders, Saul L.....253, 264, 272	Schwartz, Eric A.....258	Sher, Paul P.....258, 278
Sanger, Bertram J.....253	Schwartz, Herman252, 271	Sherman, Harold P.....290
Sanger, Grant261, 286	Schwartz, Iris W.....271	Sherman, Stanley262
Sank, Dianc284	Schwartz, Joseph S.....255	Sherman, Warren T.....274
Santiago, Hector258	Schwartz, Miles J.....274	Sherman, William B.....253, 274
Santos-Palomo, Victor257	Schwartz, Murray291	Sherwood, Edward S.....256
Santulli, Thomas V.....240, 261, 286	Schwartz, Robert M.....259, 279	Shettles, Landrum B.....256, 276
Sarcn, Martin281	Schween, P. H. Gustav.....284	Shich, Stephanie271
Sarkisian, Sarkis S.....278	Schweich, Leo253	Shiller, Jack G.....258, 279
Sarlin, M. Bruce284	Schwitzcr, Morton D.....264, 281	Shimkin, Peter M.....261
Sattely, Cccilia285	Sciarra, Daniel255, 275	Shimomura, Sciichi274
Savarcse, John253	Sciclo, Charles M.....256	Shiratori, Tatsushi273
Savetsky, Lawrence257, 264, 277	Scrimshaw, Susan288	Shookhoff, Howard B.....254, 280
Savitsky, Elias283	Scrivani, Steven S.....290	Shriva, Stava K. C.....279

PAGE	PAGE	PAGE	
Shucart, William	255	Snyder, Ralph W.	278
Shulman, Herbert S.	255	Snyder, Richard N.	258
Shulman, Victor	258, 259	Socollar, Sidney J.	280
Siegel, Charles	260, 283	Sokal, Myron M.	259
Siegel, Hano A.	261, 285	Soley, Max	254
Siegel, Kenneth L.	291	Solimene, Alfonso	270
Siegel, Morton R.	282	Solomon, Alvin L.	290
Siegler, Marvin M.	258, 280	Solomon, Charles S.	290
Siegmund, Athilia E.	282	Solomon, Gail E.	256
Sikes, Ralph F.	281	Solomon, Marvin	291
Silbermann, Maximilian	255	Sobel, Harold	278
Silbert, Robert	284	Sommers, Sheldon C.	278
Silko, Kathleen	290	Sommerville, David L.	258
Sills, Stephen J.	257	Sours, John A.	259, 283
Silson, John E.	282	Southam, Anna L.	276
Silva-Hutner, Margarita	264	Southworth, Hamilton	253, 272
Silverman, Joseph A.	258, 265, 279	Spagnola, Roberta M.	275
Silvers, Herbert F.	292	Spain, David	278
Silverstein, Ellen F.	255	Spalding, Charles F.	284
Silverstein, William H.	290	Spalter, Harold F.	257, 277
Simbonis, Stanley S.	278	Speck, William T.	259
Simkin, Roger D.	271	Spector, Abraham	277
Simmel, Arnold G.	283	Speert, Harold	256, 276
Simon, Gilbert	258, 279	Spencer, Vernon F.	281
Simon, Jane	258	Spengeman, Walter G.	291
Simon, Lawrence F.	287	Speroff, Leon	256, 288
Simons, Betty	281	Sperry, Warren M.	270
Simpson, George	284	Spiegel, Herbert	260, 283
Simring, Steven S.	260	Spiegelman, Sol	264, 265, 272, 287
Sinclair, John C.	258, 279	Spier, Roger D.	262
Singer, Milton	258, 279	Spitzer, Robert	283
Singer, Paul	260, 284	Spooner, Maryloo	254, 273
Singer, Saul	262	Spotnitz, Henry M.	262
Singerman, Ronald N.	291	Springer, Bettie H.	276
Singh, Arun K.	262	Springer, Charlotte F.	261, 285
Sioussat, Robert S.	273	Sprinson, David B.	264, 265, 266, 271
Sitarz, Anneliese L.	258, 279	Sprung, Katherine	258, 279
Skazywan, Yolanta	256	Squarrito, Salvatore J.	292
Skene, David S.	252	Srinivasan, Parithychery R.	271
Skilbred, Lars A.	257, 277	Srole, Leo	282
Slaney, Charles A.	262	Staats, Marilyn T.	276
Slater, Lewis M.	254, 274	Stachura, Irene	279
Slatkin, Meyer H.	253, 272	Stahl, Theodore J.	254
Slevin, John J.	254	Stankewick, Walter R.	258, 279
Sloan, Lawrence W.	240, 252, 270	Stanley, Theodore H.	253
Smelser, George K.	264, 270, 277	Stanley-Brown, Edward G.	287
Smith, Alan DeForest.	240, 252, 270	Stark, Richard B.	287
Smith, Alexander B.	291	Starr, Norman J.	253
Smith, Arthur M.	262	Starr, Wilson C.	257, 277
Smith, David J.	266, 271	Starr, Stuart	259
Smith, David M.	257	Stearns, Sheldon W.	260
Smith, Frank R.	255	Stearns, William H.	254, 273
Smith, Jr., James C.	261	Stebbing, Jr., James H.	281
Smith, Jeanne A.	273	Steeg, Carl N.	259, 279
Smith, Gilbert P.	252, 266, 290, 291	Steer, Charles M.	240, 256, 264, 265, 276
Smith, Harry P.	240, 252, 270	Steibel, William	292
Smith, John T.	257	Steigman, Harry	282
Smith, Kendon W.	260, 281, 283	Stein, Arthur	260, 284
Smith, Martin DeForest.	253	Stein, Bennett M.	255, 274
Smith, Philip E.	270	Stein, Jeffrey A.	255, 273
Smith, W. Bryon	259	Stein, Marilyn A.	276
Smith, William H.	259, 279	Stein, Sanford W.	260
Snow, William B.	252, 270	Stein, Zena A.	281
Snyder, Arthur I.	254, 273	Steiner, Alfred	254, 272
Snyder, Joseph E.	249, 282	Steiner, Jerome	260, 284
		Steiner, Nicholas V.	274
		Steinerman, Stanley M.	292
		Stent, Theodore R.	264
		Stella, Sergio R.	255
		Stember, Rishon	260
		Stent, Theodore R.	285
		Stephensen, John A.	280
		Sterling, Kenneth	254, 274
		Stern, Aaron	283
		Stern, Daniel N.	283
		Stern, Donald D.	255
		Stern, Martin	290
		Stern, Morton J.	290
		Steuer, Irwin	291
		Stevenson, Stuart S.	258, 264, 280
		Stewart, Charles F.	287
		Stewart, David W.	282
		Stewart, E. Spencer	262, 286
		Stewart, Phillip R.	274
		Stiehm, William	261
		Stiles, David	259, 279
		Stinchfield, Frank E.	240, 257, 264, 265, 277
		Stock, Richard J.	253, 273
		Stoerk, Herbert C.	278
		Stokes, Janet H.	284
		Stokes, Shirley A.	275
		Stoll, Frances A.	290
		Stolnacke, Richard A.	282
		Stone, J. Gilbert	253
		Stone, Michael H.	260, 284
		Straker, Hilda G.	253
		Strande, Carl S.	259, 279
		Strauss, Harold	255
		Strauss, Raymond B.	257, 278
		Strayer, III, Luther M.	257
		Streifeld, Franklin	261
		Striker, Paul S.	262, 286
		Struening, Elmer L.	281
		Suarez-Reyes, Luis	253, 272
		Sullivan, Albert L.	255
		Sullivan, Dana L.	253
		Sullivan, Stuart F.	252, 271
		Sullivan, Thomas J.	259, 262, 287
		Sulman, Michael	257, 278
		Sun, Sally S.	256, 258
		Suskin, William H.	292
		Susser, Mervyn W.	280
		Sussman, Howard H.	258
		Sussman, Leonard	259
		Sutton, Samuel	283
		Sutula, Jr., Stanley J.	257
		Suzuki, Jiro	275
		Suzuki, Kotaro	276
		Sward, Kathleen	282
		Swartz, Donald P.	276
		Swartz, Herbert	255
		Sweeney, Eugene W.	253
		Sweeting, Joseph G.	254, 273
		Swerdloff, Bluma	283
		Swift, Lucy H.	259, 280
		Sy, Fabian	262
		Symonds, Jr., Francis C.	261, 286

PAGE	PAGE	PAGE
Szalita, Alberta B.....283	Tonndorf, Juergen	Verdisco, Loretta
Szmarzg, Ruth260, 284	Tookolian, Hagop	Verlin, William A.....291
Taggart, John V. 253, 264, 265, 266, 272, 280	Topal, Samuel	Vero, Nicholas A.....292
Takemura, Yoshihiro	Tornusciolo, Alfonso	Verosky, Mariagnes
Takeshige, Kotohitto	Torrens, Paul R.....256, 276	Vestergaard, Per B.....284
Talmud, Blanche	Torstenson, Barbara J.....276	Vicale, Carmine T.....255, 275
Tamerin, Joseph	Tovell, Harold M. M.....276	Vicari, Giuseppe
Tamir, Hadassah	Tracht, Myron E.....278	Vicens, Cristobal A.....254, 273
Tanenbaum, Stuart W.....264, 274	Traugh, George H.....261	Viederman, Milton
Tannebaum, Iva R.....262	Travnicek, Miloslav	Villaneuva, Raymond
Tannebaum, Myron ..258, 278, 287	Trei, Alice R.....287	Vita, Martin B.....259, 279
Tantibhedhyangkul, Phienvit ..259	Tretter, Patricia	Vitikainen, Kari J.....262
Tapley, Donald F.....253, 265, 272	Tretter, Wolfgang	Vnek, John
Tara, Harold H.....287	Trichter, Samuel	Voelker, Faith H.....276
Tarlov, I. M.....275	Triner, Lubos	Vogel, Henry J.....274, 278
Tarshis, Julius	Trokel, Stephen L.....257, 277	Vogel, Howard B.....290
Tator, Robert B.....274	Tsueda, Kentaro	Vogel, Ruth H.....278
Taubenhaus, Leon J.....282	Tuason, Josefa L.....260	Von Bockstaele, Pierre G.....286
Taxin, Richard N.....261	Tucci, Paul	von Hofe, Frederick H.....258
Taylor, Jr., Howard C. 240, 252, 265, 270, 288	Tucek, Charles O.....260	Von Micsky, Lajos
Taylor, Lawrence E.....286	Tuchman, Walter	Voorhees, Jr., Arthur B.....261, 286
Taylor, Peter T.....261	Tueting, Patricia A.....283	Vosburgh, Gilbert J.....256, 276
Taylor, Reginald	Tullis, John L.....278	Voss, Carlyle
Tchnag, Felix	Turgeon, Livia K.....281	Vrachnos, Themistokalis
Tease, Jean	Turino, Gerard M.....253, 272	Vratsanos, Spyros M.....274
Teichner, Victor	Turnauer, Elizabeth F.....259, 279	Vulpis, Giovanni
Teisch, Joel A.....253	Turner, Robert A.....287	Wagers, Lawrence T.....253
Teixidor Hind S.....285	Tyson, Jr., Cornelius J.....254, 273	Wagner, Bernard M.....258, 278
Telfer, Robert B.....256	Tyson, T. Lloyd.....254, 273	Waldo, Albert L.....262, 280, 286
Teltsch, Edward E.....291	Tytun, Alex	Walker, Howard Lee.....256
Temple, Robert J.....255	Uccellani, Ennio L.....266, 291	Wallace, Robert E.....281
Tenner, Michael S.....261, 285	Udenfriend, Sidney	Walsh, Robert F.....292
Tennyson, Virginia M.....278	Ufford, Elizabeth	Waltner, Jules G.....257, 277
Tepperberg, Jerome	Ulan, Martin S.....282	Walzer, Richard A.....253, 272
Terada, Masaaki	Umans, Robert	Wang, Chung C.....281
Terenzio, Joseph V.....282	Umhey, Charles	Wang, Hsueh-Hwa
Terenzio, Peter B.....290	Underbrink, Alan G.....285	Wang, Shih-Chun
Terestman, Nettie	Underwood, Barbara A.....281	Warburton, Dorothy
Terry, Jr., James H.....287	Untereker, John J.....285	Warren, Lucy DeS.....276
Terzakas, John A.....278	Urm, Elo	Warren, Michelle
Thetford, William N.....283	Usami, Shunichi	Warren, William A.....272
Thieman, Philip W.....262	Uson, Aurelio C.....262, 287	Wasserman, Bernard H.....291
Thomas, III, Henry M.....254, 273	Valcarel, Marta	Waszcuk, Madeline
Thomas, James C.....261	Vanacek, Russell J.....291	Waterson, Jr., Karl W.....253
Thomas, Joseph J.....256	Van Alstine, Helen	Watkins, Elizabeth B.....259, 280
Thomas, Samuel F.....255, 275	Van Canegham, Adrian.....273	Watkins, Melvin B.....257
Thomas, Jr., William C.....264, 281	Vande Wiele, Raymond L.....256, 276, 288	Watson, Benjamin P.....240, 252, 270
Thompson, Errol A.....278	Vandiveer, Janet C.....285	Watson, Patrick E.....253
Thorne, Irving J.....286	Van Dyke, Frank W.....280	Wax, Sander H.....262, 287
Thornhill, Herbert L.....261, 285	van Dyke, Harry B.....270	Weber, John J.....283
Thrower, Ann	Van Etten, Royal C.....252	Webster, Jerome P.....252, 270
Thurer, Richard J.....262, 286	Van Meter, Sharon H.....258	Wechsler, Michael D.....262
Ticnor, Amarylius A. O.....275	Van Ness, Edward H.....282	Wehrle, Mary Julie
Tietjen, George W.....262	Van Itallie, Theodore B.....254, 274	Weil, III, Richard
Tietze, Christopher	Van Praagh, Ian Gerald	Weiler, Martin E.....283
Tillman, Alvin J. B.....256	Varma, Andre O.....281	Weinberg, Daniel
Tobin, Michael	Vassallo, Enrique M.....260	Weinberg, Sidney B.....282
Todd, James S.....262, 286	Vayda, Cherry L.....282	Weiner, Louis
Todd, Jean	Veenema, Ralph J.....262, 264, 287	Weinstein, Ephraim
Todd, W. Duane.....256, 264, 276	Venuto, Ralph J.....257	Weinstein, I. Bernard
Tomashevsky, Philip	Verdi, Gerold D.....262	Weinstein, Joel D.....257, 277
Tomasulo, Joseph		Winstein, Samuel
		Weintraub, Gerald
		Weir, III, James H.....256

PAGE	PAGE	PAGE
Weiss, Benjamin 271, 283	Wilking, Leo F. J. 258, 279	Wurster, Richard D. 262
Weiss, Bernie J. 262, 286	Wilking, Virginia N. 284	Wylie, John V. 262
Weiss, Harvey J. 274	Willetts, Arthur T. 262, 287	Wylie, Robert H. 261, 265, 286
Weiss, Robert M. 280	Williams, Alfred J. 276	Wynder, Ernest L. 280
Weissbach, Arthur 272	Williams, Arthur C. 282	
Weissbach, Herbert 272	Williams, Ellaleen C. 282	Yahr, Melvin D. 241, 255, 264, 265, 275
Weissberg, Josef H. 260, 283	Williams, Gail 255	Yarus, Stanley S. 260
Weissman, Bruce W. 257, 278	Williams, Hugh R. 284	Yeaw, Ralph C. 262, 287
Weitzen, Hyman G. 255, 275	Williams, Roberta 259	Yergan, Charles M. 274
Wells, Josephine 240, 261, 285	Williams, Roger W. 280	Yergan, Max Jr. 286
Welsch, Exie E. 260, 283	Williamson, Susan W. 256, 276	Yim, Frances Dae Il. 275
Wermer, Paul 254	Wilner, George D. 258, 278	Yoeh, Chin Bor 287
Werne, Benjamin 282	Wilson, Agnes G. 258, 279	York, Albert T. 257
Werner, Sidney C. 253, 272	Wilson, Charles S. 261	Young, Jr., Alexander W. 253, 272
Wertheim, Arthur R. 253, 272	Wilson, John M. 286	Younger, Lee R. 255
Wesley, James E. 264, 282	Wilson, Roger S. 253	Yu, Fu-Li 287
West, John P. 254, 277	Windrow, Mary E. 240, 249, 275	Yue, Shyh-Jong 261, 285
West, Robert 259, 279	Winicoff, Richard N. 255	
Westerhoff, Jr., Peter D. 257, 278	Winikoff, Donald Alvin 259, 279	Zablow, Leonard 275
Westfall, Jr., Franklin 257	Winikus, Winifred 283	Zacharioudakis, Basil 286
Wethers, Doris L. 259, 279	Winocur, Manuel M. 278	Zamelis, Ansis 254, 273
Wharton, Ralph N. 260, 283	Winslow, T. Scudder 287	Zamora, Manuel T. 255
Wheaton, Jr., Earl A. 254, 273	Winters, Robert W. 258, 279	Zanes, Anne S. 281
Wheeler, Edward M. 277	Wirostko, Emil 257, 277	Zapata-Martinez, Rafael 259
Wheeler, Maynard C. 252, 257, 270	Wise, Carl R. 241, 249, 254, 265, 273	Zawadsky, Joseph P. 257, 277
Wheeler, Robert C. 259, 279	Wishik, Samuel M. 280, 288	Zegarelli, David J. 258
Whelan, Charles A. 261	Wit, Andrew L. 280	Zegarelli, Edward V. 253, 266, 267, 292
White, Eric S. 257	Witkovsky, Paul 277, 280	Zeidenberg, Philip 260, 284
White, III, Robert R. 287	Wolarsky, Evan 262	Zeisler, David 291
Whitfield, Jr., Randolph 257	Wolf, Abner 252, 270, 275, 279	Zeller, Robert S. 256
Whitfield, Stanley 278	Wolf, Charles E. 252, 271	Zengo, Albert 291
Whitlock, James P. 259	Wolff, Grace 259	Zerden, Edward 292
Whitlock, Robert T. 240, 254, 273	Wolff, James A. 258, 279	Ziegler, Elizabeth H. 255, 273
Whitman, Clifford LeR. 291	Wolff, Marianne 258, 278	Ziegler, Thomas W. 255
Whitten, William W. 259, 279	Wolfman, Cyrus 260	Zikria, Bashir A. 262, 286
Whittier, John R. 284	Wollowick, Herbert 261	Zimberg, Sheldon 282, 284
Wichern, Walter 287	Wolmer, David H. 291	Zimmering, Paula E. 271, 276, 288
Wickremesinghe, Anthony E. 253	Wolnitz, Arthur H. 278	Zinsser, Hans H. 262, 287
Widrow, Maxwell 291	Wood, Barry G. 274	Zintel, Harold A. 287
Wiedel, Philip D. 261, 265, 286	Wood, Ernest H. 261, 285	Zipf, Richard F. 257
Wiederhorn, A. Roger 262	Wood, John A. 254, 272	Zipper, Howard D. 257
Wiener, Jerry M. 260, 284	Wood, Karen K. 276	Zitzmann, Eric K. 257, 277
Wigger, H. Joachim 258, 278	Woodman, DeGraaf 252	Zorach, Peter 255
Wigle, Ronald 255	Wotman, Stephen 291	Zorn, Jr., George L. 262
Wiklund, Richard A. 253	Wray, Edwin O. 275	Zubin, Joseph 282
Wilcox, Daniel A. 259, 279	Wu, Anna Fang 271	
Wilcox, Jr., Herbert B. 253, 264, 272	Wu, Daisy Y. 281	
Wilens, Sigmund L. 258, 278	Wu, John C. 279	
Wilkie, George H. 260, 283		

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